

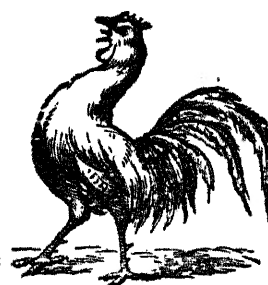
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THE
JERSEY, ALDERNEY,
AND
GUERNSEY COW



HOW TO CHOOSE
MANAGE, AND BREED
TO THE MOST PROFIT

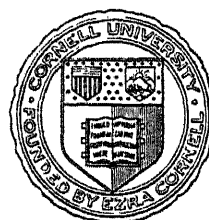
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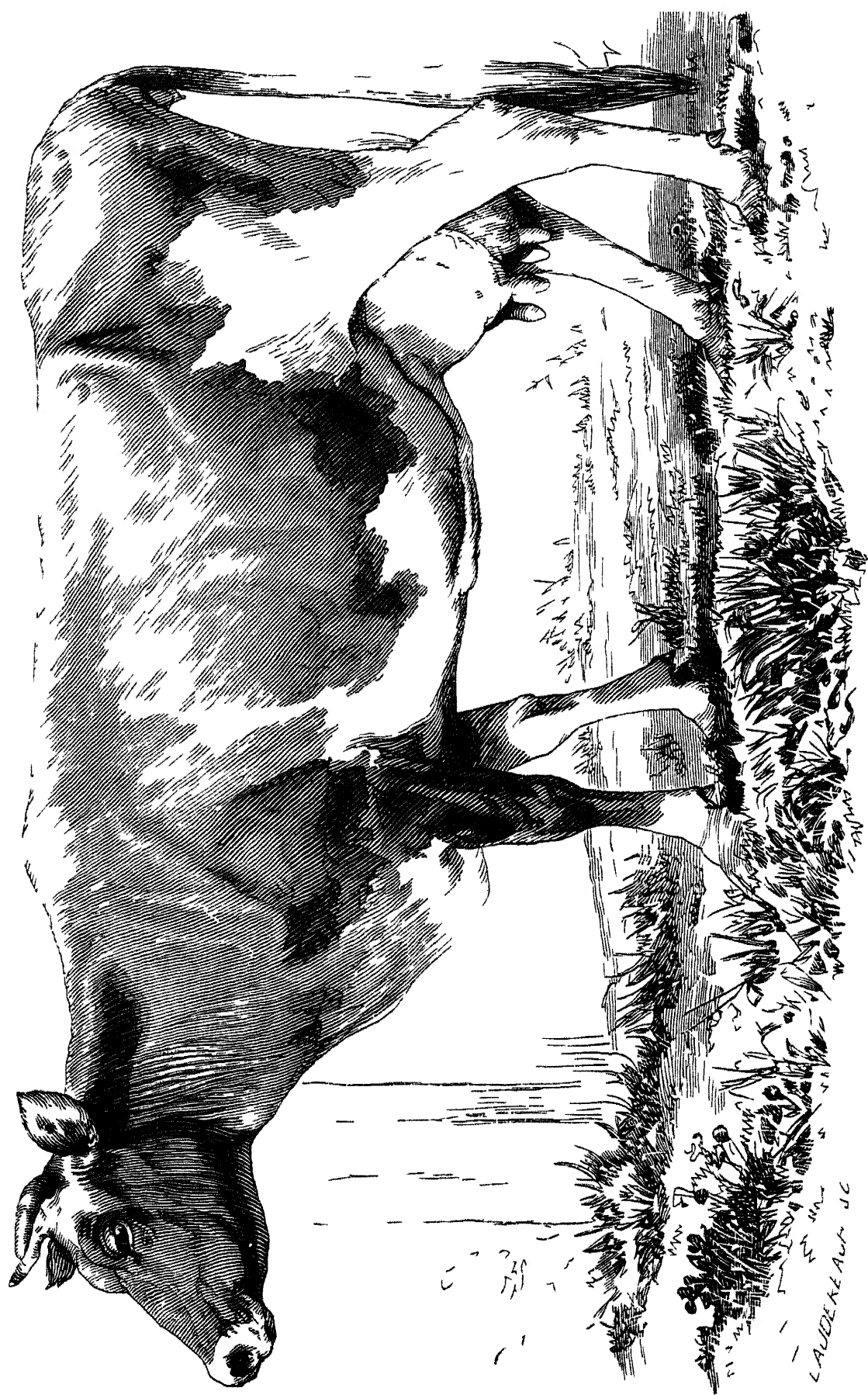
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THE
J E R S E Y,
ALDERNEY, AND GUERNSEY
C O W:

THEIR HISTORY, NATURE AND MANAGEMENT.

SHOWING HOW TO CHOOSE A GOOD COW, HOW TO FEED, TO
MANAGE, TO MILK, AND TO BREED TO THE MOST PROFIT.

EDITED, FROM THE WRITINGS OF
EDWARD P P FOWLER, GEO E WARING, JR, CHARLES L SHARPLESS,
PROF JOHN GAMGEE, C P LE CORNU, COL LE COUTEUR, PROF
MAGNE, FR GUENON, DR TWADDELL, AND OTHERS,

By WILLIS P. HAZARD.

ILLUSTRATED.

PHILADELPHIA:
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PREFATORY.

It has been wittily and wisely said, "It is a good thing to live in the country," to which may more safely be added, "It is a good thing to have a first-rate cow." Though it is rapidly being proved that cows of the Jersey and Guernsey breeds rank as first-rate for richness of milk and cream, for quantity and high quality of butter, for easy keeping qualities and for delicacy of meat, there yet seemed a want of a work which proves all these excellent qualities to be possessed by these breeds, and, by bringing them more prominently into notice, to advance the interests of the agricultural community, particularly that portion of it residing in the vicinity of large cities and towns; though by the constantly increasing advantages offered by most of the railways distant portions of the country are brought more nearly and advantageously together.

In the accompanying pages the editor—for he claims nothing more than bringing together important facts about these breeds—has endeavored to present the

history and management of the Jersey and Guernsey cow in their native lands, together with such short rules for their management in their new home as will tend to make these superior breeds better known and more profitable wherever introduced. With this view he has unhesitatingly made use of material by some of the best of our agricultural writers, but has endeavored in most instances to give credit to the source from whence it was derived. He believes he has thus brought together in a condensed form a mass of valuable material which will be useful to the professed breeder, the amateur farmer or the practical dairyman; and fairly presented the merits of the best breed of cows for the butter- and cheese-maker, for the lover of rich cream and milk, and for the admirer of the beautiful in nature.

WILLIS P. HAZARD.

MAPLE KNOLL, NEAR WESTCHESTER,
May, 1872.

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THE
JERSEY,
ALDERNEY AND GUERNSEY COW.

INTRODUCTORY CHAPTER.

THE general preference which has been shown of late years for the cows of Alderney and Guernsey, as producing a higher quality of milk for dairy purposes than other species, has induced the author, as well from his own conviction of its necessity as from the suggestions of friends and customers who have felt the want of such a treatise, to place the following epitome of his knowledge and experience before the public.

Until very recently an impression has much prevailed that the cow of the Channel Islands was unfitted, by its apparently delicate appearance and blood-like breeding, for the use of such persons as were unable to bestow on it the most assiduous attention and care; but experience and a more intimate acquaintance with the animal have shown that this impression is entirely without foundation, and we now constantly see the Alderney

Cow thriving under circumstances that would be fitting for any other cow kept for the same purpose—viz., milking and breeding.

The Channel Islands Cow will be found invaluable for private family use, from its docility, easy pasturage and small consumption, in comparison with the peculiar richness of its milk, the average in a dairy of forty cows, under such management as is hereafter set forth, having been ten pounds of butter from each cow per week; whereas in other dairies not more than from six to seven pounds is producible from the ordinary milch cow—where alone quantity of milk has been desired—which is not the main object in a private family.

We have, therefore, in the animal under consideration the triple advantage, as before stated, of a symmetry of form which renders it an ornament to the gentleman's lawn and paddock; a docility which makes it quiet under the tether and in the hands of the milker, whether male or female; and a richness of production which not only fills the dairy with butter, but that of a firmness which it retains in the heat of the summer and a richness through the cold of winter, when the butter of the ordinary cow is barely marketable.

The prejudice against the Alderney which has existed amongst dairy farmers, whose object is only profit, by whatever legitimate means obtainable, is also now fast wearing away, there being scarcely one such in England who does not have a certain proportion of these cattle among his stock; experience having proved that the

introduction of the Alderney or Guernsey (especially the latter), in the proportion of one to six other cows, has so improved the character of the dairy, that from one penny to twopence per pound in advance is obtained in any market, besides the *prestige* which the best commodity will always command.

The pre-eminent utility of the Alderney Cow as a cross in breeding with the long-horn is universally allowed where the dairy is the object. For this purpose the Alderney is superior to the Guernsey, although the milk of the Guernsey is preferable to the Alderney for mixing in the dairy. The reasons which indicate the cross above mentioned are, on the part of the long-horn, its large quantity of milk, strength of constitution, longevity and indisposition to fatten in a breeding state; and on the part of the Alderney, its rich quality of milk, fine breeding and kind and quiet disposition.

The cow needed for the dairy cannot, under any circumstances, be selected for those qualities which will produce fat: the two natures are incompatible; to have the best meat, we must get rid of every tendency to milk; and to have the best butter, we must obviate every disposition to fatten. We cannot have both qualities in the same animal, and the attempt will only end in disappointment.

The results, then, of the above remarks are these: that in the first place the Alderney Cow is, above all others, especially the cow for the gentleman's lawn and paddock, and the only means by which the dairy farmer

may revert to the peculiar and important principle, so long lost sight of, which places breed beyond bulk, and was contemplated in the old adage that says—

“The cow to breed,
The ox to feed.”

We shall now give, from the best authorities, sketches of

THE HISTORY AND HOME OF THE JERSEY COW.

In “Appleton’s Journal” for January 1, 1870, is the following interesting description of

THE CHANNEL ISLANDS.—“In a deep bay of the north-west coast of France, opposite to the centre of the south coast of England, lies a cluster of rocky islets, but little visited by the outlying world, and but lately brought to the cognizance of the great brotherhood of literature by becoming the retreat whence the indignant soul of Victor Hugo has poured forth its warnings and its thunders.

“They are interesting from their peculiar position, geographically, historically and artistically; and, from the fact of the principal one of them having given a name to the city and State which bids fair to rival the maritime metropolis of the United States, they deserve more than a passing notice.

“Only four of them are inhabited: Sark, by one family and their dependents; Alderney, by the Government officers of the Harbor of Refuge and a few fishermen; Guernsey, by a thriving seafaring population; and Jersey, by one of the most complete colonies of small

gentility possible to conceive. All these have preserved to this day their ancient forms through all the political disturbances of eight centuries. When the Norman mail-clad warriors debated at Rouen the question of their invasion of Saxon England, many of the lords of feudal territories in the Channel Islands were in the conclave, just as some of their grandsons took part in the other great march eastward of those fearless buccaneers under Godfrey of Bouillon, whose castle still looks over the narrow strait of seven miles of stormy sea dividing Coutances and Jersey. Channel-Islanders fought with Roger in the conquest of Sicily, and routed Alexis, the Emperor of Constantinople, on the shore of Butrinto. This story is ludicrously particularized by the Emperor's daughter, Anna Comnena, the historian of her times. The expedition, which sailed from Sicily for the conquest of the Eastern world, met with misfortune from its outset. Storms and tempests, hunger and finally disease had thinned their ranks and broken their pride, so that the Byzantine army found their tents tenanted by only five hundred knights, attenuated by short commons and prostrated by fever—

‘ Their gesture sad,
Investing lank, lean cheeks and war-worn coats,
Presenteth them unto the gazing moon
So many horrid ghosts’—

as the genius of Shakspeare portrayed the famished host of Plantagenet Henry's ragged array at Agincourt. No wonder that the rich and overfed Orientals treated

them as the Constable of France did the famished Englishmen—offered them ransom, ‘that their souls might make a peaceful retire from off the fields where, wretches, their poor bodies must lie and fester.’ But such terms did not suit the Norman mind. They donned their rusty armor, and gave the Emperor so hearty a lesson that his daughter chronicles that he never stopped in his headlong retreat till he reached the gates of the Hellespont. He never tried them again.

“Of course, during the reign of the first five kings, Normandy was part of the English realm; but when King John was defeated by Philip Augustus, and the French wrested it from his sceptre, the Channel Islands had to make their choice of nationality, and they followed their crown. Since that day there has never been war between the two nations but a descent has been made and successfully resisted, but not one sun’s setting has witnessed the French flag on their shores, though many a bloody day has been fought out between the stout islanders and their near neighbors. The inventory of the families and their lands of King John’s day is still extant. The heraldic records, and many of the deeds of knights’ service and other feudal tenures of possession, still remain in the Herald’s College of Rouen, the capital of the ancient duchy to which they then belonged. The law-courts, the petty jurisdictions, even the terms, are all Norman French, as is all the language of agricultural labor, to this day. Hence,

during the long troubles of the Huguenot persecution, the Channel Islands became the retreat of the routed Protestants, who found a ready asylum, identical in language as in faith; and in later times, Royalists and Republicans, Orleanists and Reds, have hailed the snug haven of St. Helier's of Jersey as the paradise of exile, from which their longing eyes can see the fair shores of France—'for ever distant, yet for ever near.'

"No taxes or imposts have ever been laid upon these fortunate lands. No custom-house officials here prey upon the friendless stranger. Their southern climate and sea-girt situation ensure them a mild and genial atmosphere even in the depth of winter; and, where the formation of the ground affords a shelter, the vegetation, watered by a thousand rills, attains an almost tropical verdure. Their neighboring coasts and shoals afford a boundless supply of fish; the celebrated Rochers de Cancale yield the most noted and delicious oysters of the European gourmand, ignorant of the superior daintiness of the Shrewsbury and Saddlerock; while their unrivaled breed of cattle gives them an opportunity of a market in every agricultural country on the face of the globe. The islanders have not been slow to avail themselves of these advantages. Their soil is so fertile that the cows only require the circuit of their tether for food in the rich pasture, and the seasons are never severe enough to require their house-shelter. Their apples and pears are renowned in the fruit-culture, and their wonderful crops of potatoes find

a ready market, without any dues, in England; while they draw all their daily supplies from France, the markets being crowded from Coutances or Granville, ports on the other side of the narrow strait, or from St. Malo, only four hours' daily steam-transport from St. Helier's. Colleges and schools being plentiful, excellent and far cheaper than in England, have attracted families, to whom the inexpensiveness as well as abundance of household supplies has been a temptation, to this almost suburban retreat from England. Their quarries pave the streets of London; their pilots navigate the royal and mercantile fleets. Timber being imported free of all duty, shipbuilders' yards line St. Helier's Bay. There is almost daily steam communication both with London and Paris, and crowds of excursionists come gladly to be fleeced by the inn and lodging-house keepers. No wonder the islands flourish and their valleys laugh and sing! Not even religious controversy—that direst bane of civilized communities—has as yet disturbed 'the even tenor of their way.' The population, having been uniformly Puritan or Huguenot, has resisted all contact with Romanism effectually, and the Pope only reckons subjects among the foreign and alien residents of the Channel Islands. One of the two services in the churches is invariably conducted in the French language, which is spoken with remarkable purity by the higher circles. Hence a Jersey pastor, the son of a poor miller, who rose by his talents to be vice-chancellor of the University of Oxford, and died, two

years ago, bishop of Peterborough, was selected, in 1861, to preach in the Abbey of Westminster to the guests of England at the Great Exhibition of all nations, and astonished the educated foreigners by the grace and purity of his French idiom. The whole expenses of government are defrayed by the English crown, which maintains military governors, garrisons the forts and pays the militia, recruited on the Prussian model—every male adult being compelled to serve a definite period in drill, and being liable to service in the narrow circle of his home in case of war. Under these circumstances, military life is made a pleasure; and, the rifles and ammunition being always at hand, the hardy fishermen and oyster-dredgers, rocking on a calm sea, amuse themselves in their leisure by friendly emulation in shooting-matches at birds and rocks, and the frequent encounters between parishes and regiments on shore for small prizes at the fairs and revels, which still keep up the memory of the old Norman festivals, give ample opportunities of testing their skill. It is not an uncommon thing for one out of the four regiments of Jersey militia to boast of one hundred men of their rank and file who can be backed to hit the bull's-eye at five hundred yards.

“Upon all considerations, therefore, the Channel Islands have a fair claim to be thought to have succeeded to those fortunate islands of the West whose existence had puzzled the brains of the learned before the hopes they gave rise to culminated in the discovery

of the Western Hemisphere by Columbus. Though lying out of the great track of travel, they are yet in the very centre of trade and civilization. Untrammelled by legislation or custom-houses, they have free scope for the development of their rich natural resources. Too small to invite political demagogism, and too insignificant for priestly domination, they flourish in even, happy contentment, in the enjoyment of a climate, a soil and a society completely free from the disturbances which afflict and often destroy larger and more celebrated but not so free and favored communities."

In the "Journal" of the Royal Agricultural Society of England for 1859, vol. xx., is an essay by C. P. Le Cornu, from which we make extracts on

THE AGRICULTURE OF THE ISLANDS OF JERSEY, GUERNSEY, ALDERNEY AND SARK.—"Jersey, the largest and most easterly of the group, lies in latitude 49° N., longitude $2^{\circ} 22'$ W., being at a distance of eighteen to twenty miles from the nearest coast of France. In form it is that of an irregular parallelogram, eleven miles long and five and a half miles wide. The surface of the island is intersected by a continuation of valleys, which, in general, run from north to south, gradually increasing in depth and width as they approach the south, until they in many places unite and form small but fertile plains. On the northern side, the coast rises abruptly above the level of the sea to a height ranging from two hundred and fifty to four hundred feet, whereas on its southern side it is in most places on a

level with the water's edge. . . . With regard to climate, it is mild and temperate, the heat never excessive, nor yet the cold intense. The winters are such that it is not a rare occurrence for one to pass by without a flake of snow falling, or even the thermometer to remain above freezing point. During the winter months rain is most prevalent.

* * * * *

“When we consider the large population living on so small a surface—that there are two inhabitants to every acre—we almost wonder whence they derive their resources; but we must bear in mind that, although situated on a rocky bed, the soil of Jersey is particularly rich, and highly productive. The rock is of the primary formation, void of any organic remains, chiefly granite, syenite, gneiss, porphyry and schist, with other varieties belonging to this series. It might be supposed that the fact of the soil reposing on so rocky a bottom might produce meagreness, but it is not the case. The soil is a rich loam, varying in lightness in accordance with the stratum beneath it; if granite or syenite, it is lighter than where the other varieties of rock are found. The cause to which this difference is attributable is, that immediately between the granite and cultivated soil is a layer of coarse gravel, which acts as constant drainage, whereas where the granite and syenite disappear no gravel is found, but a light clay forms the layer between the soil and rock. As a general rule, the eastern district of the island may be said to belong to the

latter formation, and the western to be more closely allied to the former; but in both cases there are exceptions. For certain kinds of produce the one is more esteemed than the other, but the universal opinion throughout the island is, that the eastern district is the richest and most productive. To bear this out, it will only be necessary to state that the rent of land is considerably higher in this than in the other; and by comparing the two closely, it will be found that the clayey bottom is the most advantageous. Being retentive of moisture, it protects plants against drought; it also retains the properties of manure, which, in thinner and more open soils, are washed down by rain and lost. From this last remark it is not to be inferred that the soil of the island in any one part is altogether deficient of certain retaining properties. What is wished to be impressed is, that the varieties of soil are numerous, and differ, as has been said, in accordance with the strata immediately beneath. Here it will also be well to observe that certain localities in the vicinity of bays have, through the violence of the wind from olden times, become extremely light and sandy; but they, nevertheless, are tilled, and have in many places become highly fertile, especially in the parish of St. Clement, which may be termed the garden of Jersey, from its great and early productiveness. Jersey is well studded with trees, much more so than either of the other islands. The oak, elm, chestnut and ash are seen growing luxuriantly, but particularly the apple tree may be noticed.

Formerly a large portion of land was devoted to the culture of this fruit tree, but of late many have been destroyed, and replaced by the ordinary crops of grain, grass, roots, etc.

* * * * *

“The great subdivision of property has caused farms to be of very small extent. The law of the island does not permit land or rents inherited to be devised by will, but they must follow the law of succession. On the demise of a proprietor, the eldest son takes as his birth-right the house, etc., with rather more than two acres of land adjoining, also one-tenth of the entire landed property and rents. The remainder is then shared, two-thirds among sons and one-third among daughters, but in no case can a daughter take a larger share than a son. Thus, large estates become very much divided, but in most cases the eldest branch purchases some of the portions allotted to the junior members, who have commonly turned their minds to professional or mercantile occupations. Very many houses will be found to which only two or three acres are attached, whilst others have twenty or thirty; but an estate which contains fifteen acres is by no means considered a small one, and rarely do any exceed fifty or sixty acres. There may, perhaps, be six or eight such in the whole island. However limited may appear the size of these farms, still their value is considerable. The following are the prices at which land has been letting of late years, viz.: In the immediate vicinity of St. Helier’s,

£9 per acre; at a distance of two or three miles, £6 10s. to £7 10s.; beyond that, £4 10s. to £6.

“Bearing these prices in mind, it will be observed that farming must be carried on with great care and attention, and that the farmer must be ever watching how to turn his occupation to the greatest advantage, otherwise his business would prove a failure. In Jersey, almost every family residing in the country cultivate some portion of land adjoining their house; if but a garden, they grow fruit and vegetables for the markets; and if they have one and a half to two acres of land, they keep a cow, two or three pigs and some poultry, increasing their stock in proportion to the extent of their occupation.

* * * * *

“A farm of twenty acres, as before mentioned, will, with few exceptions (where meadow-land or orchards predominate), be distributed as follows:

	Acres
Hay and pasture.....	10
Turnips.....	2
Mangolds.....	1
Parsnips.....	1
Carrots.....	0¾
Potatoes.....	2
Wheat.....	3¾
	20

“The stock usually kept will consist of—

Horses.....	2
Cows.....	6
Heifers.....	6
Pigs.....	8

“To manage the above, and keep the whole in proper order, will require the constant attention of four persons, two men and two women. In most cases the farmer has not recourse to assistance beyond that of his own immediate household; it is, indeed, a rare occurrence for a tenant-farmer to hold a farm of this extent unless he can rely upon his own family for assistance.

* * * * *

“In Jersey, horned cattle constitute the mainstay of agriculture; it is that upon which the farmer chiefly depends for money to pay his rents. Although the Jersey cow has been the subject of much notice in different publications, and is known to all who turn their attention to agriculture, still, within these pages, some remarks on the originality, value, and peculiarities of the breed are indispensable. The animal known in England and elsewhere under the name of Alderney cow is the same which is now under our consideration. The reason for the breed going under the name of Alderney is, that from that island the first were exported to England. At present but few are obtained from Alderney. In form the Jersey cow is deer-like, and small in size; the colors mostly prized are the light red and white, the brown, and the fawn; brindled specimens are rarely seen; they are not at all valued, and may be purchased extremely cheap. The cow is naturally quiet, so much so that a mere child can manage her.”

* * * * *

In 1844, Col. Le Couteur, Queen's Aide-de-Camp in

Jersey, contributed to the Royal Agricultural Society of England an essay on "The Jersey, misnamed Alderney, Cow," which is here copied, nearly entire, from the Society's *Journal*, vol. v., p. 43:

"The breed of cattle familiarly known throughout Great Britain as the Alderney, and correctly termed, in the article 'Cattle,' of the 'Library of Useful Knowledge,' 'the crumpled horned,' was originally Norman, it is conceived, as cows very similar to them in form and color are to be seen in various parts of Normandy and Brittany also; but the difference in their milking and creaming qualities is really astonishing, the Jersey cow producing nearly double the quantity of butter.

"The race is miscalled 'Alderney' as far as Jersey is in question; for, about seventy years since, Mr. Dumaresq, of St. Peter's, afterwards the chief magistrate, sent some of the best Jersey cows to his father-in-law, the then proprietor of Alderney; so that the Jersey was, already at that period, an improved and superior to the Alderney race. It has since been vastly amended in form, and generally so in various qualities, though the best of those recorded at that period gave as much milk and butter as the best may do now.

"Ten years have elapsed since the attempt was first made by fixed rules to improve the form and quality of the Jersey cow. A few gentlemen, presided over by the then Lieutenant-Governor, Major-General Thornton, selected two beautiful cows, with the best qualities, as models. One of these was held to be perfect in her

barrel and fore-quarters, the other equally so in her hind-quarters. From these two the following points were laid down to be the rule for governing the judges in all the cattle-shows of the Jersey Agricultural Society. (See pp. 100 to 102 for scales of points.)

“The accuracy of this arrangement is proved by the fact that no deviation from it has been made, the experience of ten years having only added to the scale the points for general appearance and condition.

* * * * *

“The evil was, and still exists, that most Jersey farmers, like many others, never thought of crossing with a view to improvement, conscious of possessing a breed excellent for the production of rich milk and cream—milk so rich in some cows that it seems like what is sometimes called cream in cities—and cream so much richer, that, from a verdant pasture in spring, it appears like clouted cream. But the Jersey farmer sought no further. He was content to possess an ugly, ill-formed animal, with flat sides, wide between the ribs and hips, cat-hammed, narrow and high hips, with a hollow back.

“She had always possessed the head of a fawn, a soft eye, an elegant crumpled horn, small ears, yellow within, a clean neck and throat, fine bones, a fine tail; above all, a well-formed, capacious udder, with large, swelling milk-veins.

“Content with these qualities, the only question in the selection of a bull among the most judicious farmers was, ‘Is the breed a good one?’ meaning, solely, Had

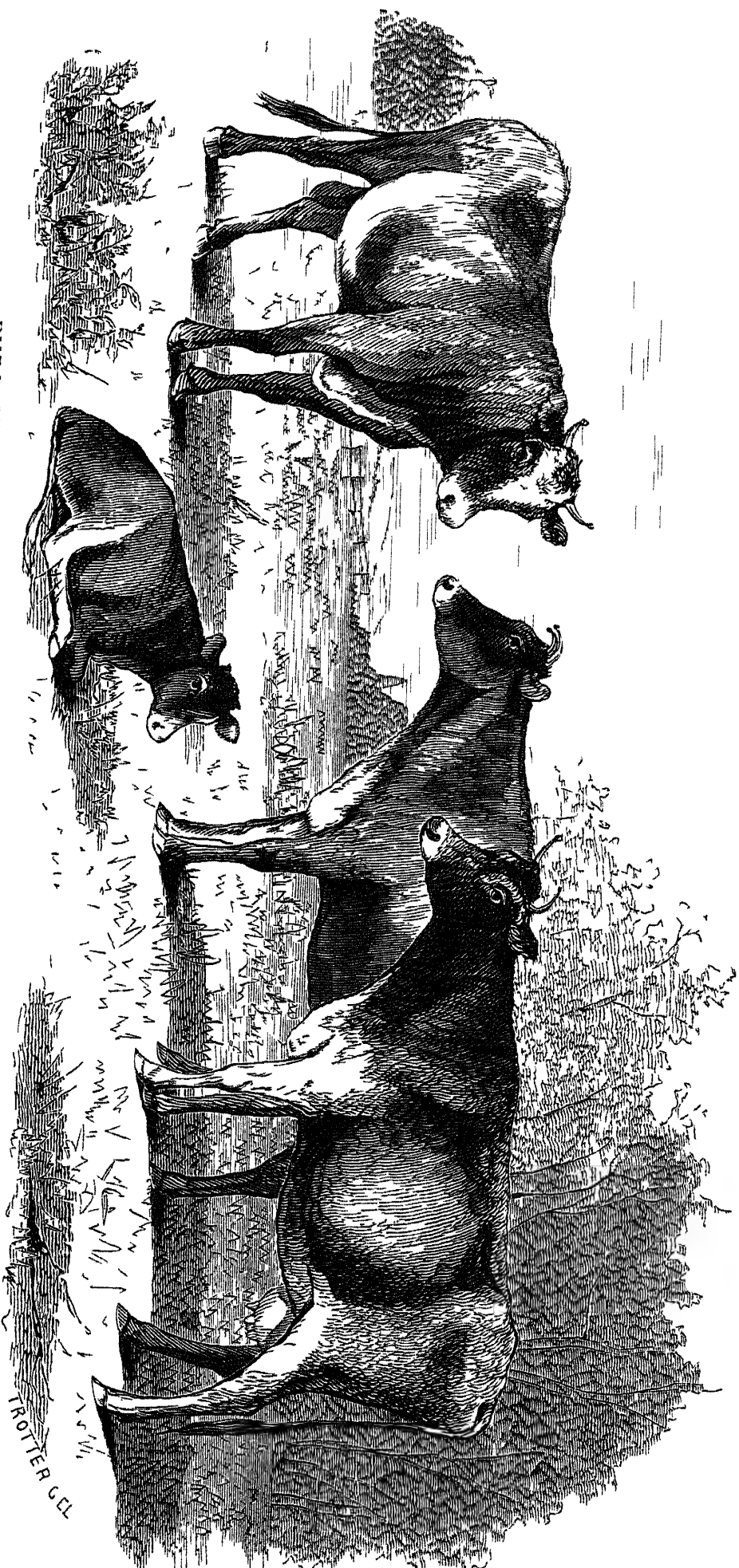
its progenitors been renowned for their milking and creaming qualities? But the mere attention to this was one of primary importance in a circumscribed spot like Jersey; it may have been quite sufficient to establish a hereditary superiority in the most needful quality. It may also have established it with a rapidity that could not have been obtained in a wide-extended country like France. Hence, perhaps, the present superiority of the Jersey over the French breed.

* * * *

“The Jersey cow is a singularly docile and gentle animal; the male, on the contrary, is apt to become fierce after two years of age. In those bred on the heights of St. Ouen, St. Brelade, and St. Mary, there is a hardness and sound constitution that enables them to meet even a Scotch winter without injury; those bred in the low grounds and rich pastures are of larger carcass, but are more delicate in constitution.

“Of the ancient race, it was stated, perhaps with truth, that it had no tendency to fatten; indeed, some cows of the old breed were so ungainly, high-boned, and ragged in form, Meg Merrilies of cows, that no attempt to fatten them might succeed—the great quantities of milk and cream which they produced probably absorbing all their fattening properties.

“Yet careful attention to crossing has greatly remedied this defect. By having studied the habits of a good cow with a little more tendency to fatten than others, and crossing her with a fleshy, well-conditioned bull of



PURE JERSEYS—"HOPEWELL," "CLEMMY," AND "LA BELL HELENE"

Imported and owned by CHAS. H. MURHEAD, Esq.

a race that was also known to produce quality and quantity of butter, the next generation has proved of a rounder form, with a tendency to make fat, without having lost the butyraceous nature.

“Some of these improved animals have fattened so rapidly while being stall-fed, from the month of December to March, as to suffer in parturition, when both cow and calf have been lost; to prevent which, it is indispensable to lower the condition of the cow, or to bleed in good time. Such animals will fatten rapidly. Their beef is excellent, the only defect being in the color of the fat, which is sometimes too yellow. It is now a fair question whether the improved breed may not fatten as rapidly as any breed known.

“Quayle, who wrote the ‘Agricultural Survey of Jersey,’ states ‘that the Ayrshire was a cross between the short horned breed and the Alderney.’

“There is a considerable affinity between these two breeds. The writer has noticed Ayrshire cows that seemed to be of Jersey origin, but none of them were said to have produced so large a quantity of cream or butter, nor was the butter in Scotland of nearly so deep a tinge of yellow as the most rich in Jersey. One Jersey cow that produces very yellow cream will give a good color to butter produced from two cows affording a pale-colored cream.

“It is not doubted that crosses from the Jersey breed have taken place. Field-Marshal Conway, the governor of this ‘sequestered isle,’ as Horace Walpole termed it,

and Lieutenant-General Andrew Gordon, who succeeded him, nearly half a century back, both sent some of the best cattle to England and Scotland. If pains were taken, the race and its consequents might be distinctly traced, which might lead to important results in breeding.

“The grand desideratum is to discover a breed that will be useful to the grazier, the dairyman, and the small farmer. In so small a spot as Jersey, it is difficult to cross the breed essentially—a great step towards it is gained by crossing cattle bred in the low rich pastures with those of the exposed hills on the western or northern coast; these being smaller, finer boned, of a more hardy constitution, and feeding on a short, rich bite, impart strength of constitution and hardihood to the larger and more delicate animals of the sheltered low grounds.

“It is believed that cattle are generally more healthy and free from epidemics here than in most countries. This may be attributable in some measure to the saline particles which, being so frequently in suspension over the island, are afterwards deposited on the herbage, and tend to its salubrity. After heavy gales, it is frequently found that the grass all across the island has a strong saline flavor. So partial are cattle to this flavor, that they will greedily devour grass which has been watered with sea-water which they previously rejected. Two pipes per acre, spread from an ordinary watering-cart, or from a pipe which may be made to pour into a long deal box, perforated with holes, will be found of great

utility where sea-water or salt can be obtained at small cost.

“The Jersey farmer treats his cow with gentleness and care; it might be more correct to say that his wife does so. On good farms she is usually housed at night, after the end of October to the end of February, if heavy rainy, hail or snow prevails. It is deemed to be healthful to give a cow a short run daily through the winter, excepting in stormy weather. At this season, which is usually several degrees warmer than in the mildest part of Devonshire, she is fed with a certain portion of straw, from 10 lbs. to 20 lbs. of hay, with about 10 lbs. to 20 lbs. of parsnips, white carrots, turnips or mangold-wurzel.

“The small portion of grass which she may pick up in the winter, with the above quantity of food, enables her to produce a rich and well-colored sample of butter till within six weeks of parturition.

“At this period, which is usually regulated to take place about the month of March or April, just when the cow, being in full milk, may soon be placed on the fresh spring pasture in April or May, she is an object of extreme care. On calving, she is given a warm potation of cider, with a little powdered ginger. Quayle hints that pet cows are further indulged with a toast in their caudle.

“The calf is taken from the cow at once, and fed by hand. It may be well to advise that, on the first occasion of calving, the calf should be allowed to draw the

cow fully; for no milking by hand will so completely empty the udder, nor cause the milk-veins to swell to their full development, as will the suction of the calf.

“Some of the early meadows produce rich grass in March; but the general flush of grass, which comes on generally late in April, is the period when the Jersey farmer looks forward with anxiety. The cow is then tethered to the ground by means of a halter 5 or 6 feet long; this is appended by a ring and swivel to a chain which encircles her horns, closed by a ring and bar; the other end of the halter is fastened to a chain 6 or 8 feet long, which is connected by a swivel and ring to a stout iron stake a foot long: this is driven into the ground by means of a wooden mallet. The cow, having this circular range of 12 feet or more, is compelled to eat it clean. She is usually moved thrice a day, and milked morning and evening, on many farms at midday also. Under this system, the writer has owned four cows that produced 48 lbs. Jersey, or above 51 lbs. imperial, weight of rich yellow butter per week in the month of May and part of June.

“In very hot weather, in July or August, it is advisable to shelter the cow from the heat and flies; otherwise, these tease cows to such a degree, by forcing them to run about incessantly, that they have no time for repose, or for chewing the cud; they, in consequence, afford much less milk or cream.

“It was anciently thought that cream from the Jersey cow was too rich for making cheese. Mr. Le Feuvre,

of La Hogue, who has a fine breed of cows, tried the experiment two years since, and succeeded to admiration. It was made from the pure milk, cream and all, as it comes from the cow. It was found that the quantity of milk that would have produced a pound of butter afforded $1\frac{1}{2}$ lb. of cheese.

“From the quantity of milk which produced a cheese of 20 lbs. weight, the *drainings* of the curds and whey, on being churned, yielded 4 lbs. of butter. This butter was of an inferior quality when eaten with bread, but was superior to any other for the making of pastry; it was peculiarly hard, and of excellent texture for such use in hot weather. The writer has tasted cheeses from Mr. Le Feuvre’s farm quite equal in quality to the richest double-Glo’ster.

“On one or two farms besides General Fouzel’s, butter is made from clouted cream in the Devonshire mode; but as this is not peculiar to Jersey, it is not noticed further than that 10 lbs. of butter are usually made in five minutes by this process. The usual way of procuring the cream is by placing the milk in pans about 6 inches deep—the glazed shallow earthenware having taken place of the unglazed deep vessels.

“It is admitted that the richest milk and cream are produced by cows whose ears have a yellow or orange color within. Some of the best cows give 26 quarts of milk in 24 hours, and 14 lbs. of butter from such milk in one week. Such are rare. Good cows afford 20 quarts of milk daily, and 10 lbs. of butter weekly, in the

spring and summer months. Butter is made every second or third day."

The following letter from Col. Le Couteur to Col. Geo. E. Waring, Jr., Secretary of the American Jersey Cattle Club, in response to inquiries made in behalf of the Club, will give interesting particulars down to a late date from the Island of Jersey:

"BELLE VUE, September 14, 1869.

"I have only experience to add to anything I may have written in my essay on the Jersey cow in the *Journal of the Royal Agricultural Society of England*, in 1844, which has reappeared in the *Transactions of the New York State Agricultural Society* of 1850.

"Our farmers have not the singular variety of ideas as to the appearance and character of our breed which you describe to prevail among the members of your Club. Our breed is believed to be a local *pure* breed, its original milking and butyraceous qualities having been improved, more than three-quarters of a century back, by carefully crossing in the line: in that view, then, without much regard to beauty of form. Later, since the formation of our present Society, of which I was the first honorary secretary in 1834, great attention has been constantly paid to combine beauty of form with butter-producing habits.

"The outline history of our breed is this: In the year 1789, the Jersey cow was already considered so good, so superior to any then known, I imagine, that an act

of our local legislature (which for such ends is quite independent of the British Parliament) was passed, by which the importation into Jersey of cow, heifer, calf, or bull was prohibited, under the penalty of two hundred livres, with the forfeiture of boat and tackle, besides a fine of fifty livres to be imposed on every sailor on board who did not inform of the attempt at importation. Moreover, the animal was decreed to be immediately slaughtered, and its flesh given to the poor. Later laws are equally stringent: no foreign horned cattle are ever allowed to come to Jersey but as butcher's meat.

“Guernsey cattle are not deemed foreign, but there are scarcely over a dozen of that breed in our island. They are of larger bone and carcass, considered to be coarse, though famous milkers, requiring much more food than the Jersey. Our judges at our cattle-shows have discarded both them and their progeny.

“Those enterprising American farmers who have visited Jersey, and have found a marked difference to exist between the cattle of the Eastern district and those of the Western district, being cursory visitors, may not have been made aware of what I am to state. I believe the type to be the same. The difference in appearance is thus accounted for: The north and north-west coast of Jersey is high and precipitous, a bold syenite rock, rising two hundred and more feet from the level of the sea. Its nearest shelter in a westerly or south-westerly direction is the island of Newfoundland, or the British-American shore. South-west gales prevail here nine

months out of the twelve. While I am writing, a hurricane from the south-west has burst over us, and burned all the exposed trees like a flame; it has ruined scores of orchards and gardens, levelled many trees, leaving the pastures like damaged hay. Hence this elevated coast has usually a short, scant, rich, nutritious herbage, from being so frequently saturated with saline moisture. Thus the cattle on this side are small, fine-limbed, and hardy.

“The southward half of Jersey may be called an inclined plane, gradually and beautifully slanting to the sea-shore, watered by innumerable streams. A part of it is a rich alluvial soil and meadow-land—so sheltered and warmed as to produce fruit and vegetables a fortnight or three weeks sooner than in my neighborhood. The cattle of this district are, consequently, fed on a richer pasture. They are larger in carcass, some think handsomer, than those of the upland. I consider them to be more delicate.

“The late Earl Spencer, and former President of the Royal Agricultural Society, England, the able and worthy contemporary of Bates, Booth, and other noted Short-horn breeders, had a fine little herd of Jersey cows. When on a visit to him at Althorp, in 1839, he strongly advised me to recommend our farmers never to venture on a foreign cross, nor with Short-horns or Devons: merely to cross the cows of the low, rich pastures with the hardy bulls of the exposed northern coasts, and *vice versa*; we had established a character

in our cows for creaming and milking habits peculiar to our crumpled-horn race, to hold to that alone, by which means our breed might continue as renowned in the next century as it has been so in the present one. Many have held to that sound advice.

"I shall be much honored by receiving a copy of your Jersey Herd-Book, and shall, moreover, feel much gratified if what I have written shall prove interesting or useful to you.

"Believe me to be, dear sir,

"Yours, very truly,

(Signed)

"J. LE COUTEUR.

"To COL. GEO. E. WARING, Jr., Secretary, etc.

"N.B.—We have never had rinderpest or cattle-plague in Jersey."

We will close this interesting chapter on the Jersey cow by adding the following very thorough and highly sensible and practical essay, by Col. Geo. E. Waring, Jr., Secretary of the American Jersey Cattle Club, and published in the Herd-Register of the Club, Vol. I., 1871; a work which every breeder of Jerseys should have, and of which Club they should become members:

"There have been many theories advanced concerning the origin of the Jersey breed of cattle, but the writer has been unable to find satisfactory evidence of the truth of any of them. It is quite certain that, however this breed may have originated, it has been vastly

modified by the circumstances under which it has so long been cultivated; and it seems to me that we need not look beyond these circumstances for the causes of its peculiarities. It is apparent from Col. Le Couteur's letter that there are two distinct classes of Jersey cattle within a region hardly larger than Staten Island, New York. As the inhabitants of these islands are within easy reach of the principal market-place, it is natural to suppose that interchanges of the stock frequently take place; and such interchanges have undoubtedly not been uncommon for a long time. Yet the distinction between the small, hardy animals of the high-coast region and the more fully developed ones of the sheltered lowlands appears to have been maintained. This indicates that the influence of local circumstances has been sufficient to counteract the effect of cross-breeding. Naturally, therefore, it is fair to think that causes which can so far modify ancestral peculiarities are amply sufficient to account for the most highly prized characteristics of our favorite race.

"Climate has much to do with the matter, through both its direct effect on the animal and its indirect effect through the quality of its food. Much, undoubtedly, is due to the admixture, by interbreeding, between the animals of the different localities. What modifications of the race are to be traced to these influences it would be impossible to determine.

"Hardly less, probably, than the effect of the foregoing causes is that of the system of agriculture neces-

sarily practised by so dense a population. The extreme delicacy of limb, the slight development of muscle, and the unusually small lungs of these animals may be taken as a natural result of the almost entire absence of exercise that we know to have long been one of the leading conditions of their lives. The perfect docility of disposition, the evident fondness of even the youngest calves for the presence of man, and the slight disposition to roam (especially observable in imported animals), have unquestionably grown from the door-yard and household-pet character of their treatment through long generations. The unusual secretion of fat in the milk may be reasonably attributed to the slight waste of the fat-forming portions of the food that moderate respiration and limited exercise make possible, and to the fact that fat in this form, rather than in flesh, has long been the prime object of the farmer's attention. The beauty of appearance, the delicate coloring, the mellow, kindly eyes, the fine horns, and the softness of the skin, may be in part due to original characteristics of the breed, or of its several ancestors, and in great part to the demand that taste and fashion have caused.

“It would be interesting to know, were it possible to discover, how far purely natural causes (climatic and geological) and how far the influence of man's needs have operated in determining the peculiarities of the breed as now known.

“Reasoning from analogy, and remembering the achievements of the breeders of Short-horned cattle,

and of the improved races of sheep and swine, it is hardly extravagant to ascribe the greater importance to human intervention.

“Of course it should be our object to improve on the best results that have yet been attained by breeders in Jersey, but we should be extremely careful how we set about it. The papers quoted at the commencement of this essay convey, probably, as good an idea as can be obtained, without a personal visit, of the social, geological, agricultural and climatic circumstances under which the development of the breed has taken place. Within certain wide limits we should be careful how we deviate from the lines of influence that these circumstances have marked.

“It is very commonly asserted that, under the warmer sun, on the broader pastures, and with the more lavish feeding that are incident to our own operations, the breed has improved since its introduction into this country; also that the progeny of imported animals are usually superior to their progenitors. It seems to me that this criticism is not unquestionably a sound one. There is no doubt that, under ordinary American treatment, the animals do increase in size, in richness of appearance, and in the quantity of their yield of milk; it is, however, very doubtful whether this general enlargement is a real advantage. The most desirable qualities of the Jersey are quite the opposite of the most desirable qualities of the Short-horn or the Ayrshire; and there seems no reason to suppose that we shall really im-

prove the breed by giving it the characteristics of larger races, else we had better breed Short-horns or Ayrshires at once.

“There are physiological reasons why it is impossible to combine the rich creaming quality of the Jersey with the fattening quality of the Short-horns. In the one case or in the other the most perfect result is to be obtained by directing the deposition of fat either to the adipose tissues or to the lacteal organs. Previous experience in breeding leaves us no ground to suppose that the highest perfection of both can be obtained in the case of an individual animal, and it is doubtless an axiom that the more we enrich the milk the more do we impoverish the body, and *vice versa*. Within certain limits there is, of course, an advantage in increasing the flow of milk, but this should not be carried to such a degree that, in the vital labor of secreting a large amount of the fluid, fat-forming matter, which would otherwise be deposited as cream, shall be consumed in the production of the animal heat whose elimination is incident to all vital processes. We can conceive a case in which the chief energies of the animal organization are devoted to the secretion of a copious flow of milk, thereby consuming a large proportion of the fat-forming matter which, under more normal circumstances, would have taken the form of cream. As a rule, though it is a rule with many exceptions, cows that yield extraordinary amounts of milk yield thin milk. This is a recognized fact among farmers, but there are

no statistics on which to base positive assertions concerning it.

“Neither is it possible to fix an absolute standard as to the most profitable daily quantity of milk. All that we can do is to watch vigilantly every circumstance that may tend to augment or decrease the performance of any desirable function. As a broad proposition, the *sole office of the Jersey cow is to produce the largest possible amount of rich and highly colored cream from a given amount of food.* Everything else in connection with the breeding of the race is, or should be, incidental. Beauty of form and beauty of color are, of course, desirable, but no wise breeder will give these features more than a secondary position. If they can be secured without detracting from economic value, they are most desirable; but if in seeking them we lose sight of the chief aim, we not only do injury to our own interests, but permanently detract from the average value of the whole race.

“The question of size is, doubtless, of great importance, but there is no positive knowledge to guide our decision concerning it; at least I am aware of no experiments that do more than to indicate which is the wisest course to pursue. So far as uncertain indications are to be relied on at all, they seem to point to medium size as the most desirable. Further experiments as to the advantage or disadvantage of large size are needed. Certain arguments in favor of the smaller size are worthy of consideration. In the case of pure breeding,

where calves have a high value, more calves will be produced with the consumption of a given amount of food in the case of small cows than of large ones; that is, a larger number of cows can be kept. In a large herd of small animals, it is easier to keep up, throughout the year, a uniform supply of milk and its products than where there are fewer animals of a larger size consuming the same amount of food. One great source of the demand for Jersey cattle is the necessity for a few quarts of milk regularly supplied for family use. A large Ayrshire or Dutch cow, giving 4000 quarts of milk during the year, will produce an oversupply during one season, and go entirely dry at another. She will consume as much food as would support two little Jerseys giving each 2000 quarts of milk, one coming in in the spring and one in the autumn. In perhaps a majority of instances, accommodation can be furnished for only one cow, and food for only a small one. For such cases the smaller Jerseys are especially adapted, such as will give ten quarts of milk at their flush, and not fall below three quarts within six weeks of the next calving; the cream increasing in proportion and becoming richer as the quantity of milk decreases, thus maintaining a satisfactory quantity for at least ten months of the year, and yielding enough for necessary use during the eleventh.

“Until we are able to establish a standard better suited to our wants than that adopted in Jersey, we shall, if we are wise, adhere as closely as possible to that. Just now, when so many new fanciers are becom-

ing interested in the breed, and are creating a factitious enthusiasm for certain points of only fancy value, there is great danger that those characteristics on which the permanent worth and popularity of the race depend will be lost sight of. The idea that it is desired to convey cannot be more clearly illustrated than by referring to the matter of black points. A few years ago, black points were unheard of as an important feature. Now a very large majority of those who have recently become interested in the subject regard a black switch and a black tongue as almost indispensable qualifications. The Herd Book published on the Island of Jersey contains the entries of 124 bulls and 474 cows; 41 of the bulls and 106 cows are 'H. C.' (highly commended). Of these 147 animals, 24 are said to have black switches, and only one to have a black tongue. So, too, with regard to color. 'Solid' color is with many regarded as indispensable to perfection. Of the 147 'H. C.' bulls and cows, only 45 are of solid color or nearly so. These indications, like the much larger number of white switches and white patches, are given, not at all as being of special advantage, but merely as distinguishing marks to serve for the identification of the animals.

"That a decided injury has been done by those who attach more importance to black switches than to good udders, to solid color than to large milk mirrors, must be evident to all who have had an opportunity of comparing the older with the newer herds—animals that

have been bred here for several generations with those that have been recently imported. It sometimes seems that the best stock must have already been cleared out from the Island of Jersey. Some herds, said to have been selected with great care and at high cost, have appeared to be deficient in milking quality, and in the indispensable yellowness of skin; while their solid gray and fawn coloring and the preponderance of black switches indicate plainly enough the standard according to which they were selected. In the case of these herds and of a number of the sales importations, there is an almost universal defectiveness of the forward quarters of the udder, the front teats being carried high up on the forward slope of the bag, and being not more than one-fourth as large as the hind teats.

“Now and then, however, an experienced judge, selecting cattle on the island, brings over as good animals as we have ever received—animals on which there are generally broad patches of white, but whose udders are broad, well carried forward, evenly teated, and of the good old texture and size, while the milk mirror and the milk-vein have evidently been an especial object in the selection. So far as the writer’s personal observation has extended, he has never seen a really first-class cow without decided white marks; and of the six best butter-makers he knows, not one has a black switch or a black tongue. This, of course, proves nothing, for there may be better cows than he has ever seen whose color is uniform, and whose tongues and

switches are black as night. The statement is made only as an indication that for the valuable characteristics, the real usefulness of a cow, these new-fangled points may have no value. As a matter of taste, or beauty, or fashion, they may have great value, but I conceive that those who are seriously undertaking to maintain the breed in its purity and perfection will give these distinctions their merited go-by, and strive to maintain the wonderful butter-developing qualities of the Jersey. Manage as we may in this regard, we cannot fail to secure a deal of beauty. The fine, waxy horn, the light fillet around the muzzle, the mellow eyes, and the clean-cut, blood-like look never appear in greater perfection and beauty than in the case of the very best butter-making animals. On the other hand, the most uniform of grays should never be allowed to redeem a thick neck and shoulder and a beefy jowl.

“It is desired to maintain, as the most essential principle of all in breeding Jersey cattle, that improvement should march with an eye single to an increase of the butter-producing quality, very little regard being paid to the question of color, which, in the case of a cow that would give 300 pounds of butter per annum, might be either white or black, or anything between. Those who make beauty of appearance the chief aim of their operations had better make it the sole aim, and give up the cows and breed the more beautiful deer at once.

“Beauty and utility are, of course, very often combined. Variations from the fixed type are the rule

rather than the exception in the breeding of a composite race like the Jerseys. Their excellences seem to have been derived from several sources, and viewed by itself, this race might almost be regarded as a mixed one. It is only when compared with other races that its typical individuality becomes manifest. However much a herd of Jerseys may vary among themselves, not one of them ever looks like a Short-horn, an Ayrshire, or a 'native.' Within the varying range of color and form that the breed presents, there are many points, such as the black switches and the uniform hues, which may be singled out for the especial attention of the breeder, and may be made in a few generations much more permanent and conspicuous than they naturally are. While it would not be impossible, it would be extremely difficult, to give prominence to two distinct features—to the large milking qualities and to the black points—at the same time. The difficulty of selection would be increased many fold. It would be *possible*, no doubt, to establish a herd of 15 lb. cows with the leading fancy color points, but it would require a long time, great care, and probably an important sacrifice of form and fineness. Then again, by the time perfection had been attained, the question of color might have come to be little regarded, or the fashion might have changed entirely to fawn and white color, with white switches and light-colored tongues. If we are to be fanciers in the sense in which those are who breed pigeons, then we may very properly set up a fancy standard, and breed

to a hair. But if we are to take a farmer's view of the subject, and breed for whatever will produce the most money, then we should by all means seek for such a large yield of yellow cream as will maintain the unquestioned superiority of the Jersey for the economical conversion of food into butter, and such striking typical beauty as shall keep her always the favorite cow for ornamental purposes—a beauty that does not depend on an adherence to arbitrary points, but on fineness of breeding, symmetry of form, variety and harmony of color, and the deer-like characteristics of head and eyes for which the race is noted. Such a standard of beauty as this, admitting great variety of color, allows us to seek our great milkers through a much wider range of animals.

“The indications of great milking are the same with these animals as with all others, and it would be inappropriate to give, in an essay on a single breed, a treatise on the milch-cow at large. We all know by actual test, and most of us by observation, which are our best and richest milkers; we can form a pretty good opinion of the quality of the animals in our neighbors' herds. From among such of these best cows as are up to our standard of beauty we might select the dams of our future herds; and by always keeping the best and selling off all below the best, as well as occasionally some very good cow that has fallen away too much in point of beauty, we might be able, in time, to establish a stock of much greater excellence than any

now existing. Success in such an undertaking requires not only a good deal of knowledge at the outset, and careful attention and study for years, but it demands that a standard be established at the commencement from which no influence shall induce us to deviate. The points of excellence that are to be considered as absolutely essential should be as few as possible, but in such as we do adopt we should stop at nothing short of absolute perfection.

“It is out of the question, of course, for a single writer or for any committee to fix the standard toward which all should breed. It is suggested, however, as a very good standard, in the absence of a better, to seek to raise cows of *moderate* size that will produce 300 pounds of butter in a year, and that, while being of various colors, with a goodly proportion of white, should *all* be striking examples of the characteristic beauty of the race. For value and satisfaction to their owner, a herd of such cows might compete most favorably with a herd of solid French grays with black points, which, even with larger size, would yield only two-thirds the amount of butter.

“While, so far as personal indications are concerned, more reliance is to be placed on the appearance of the cow than of the bull, in establishing a herd the bull is, of course, of infinitely more importance than any single cow, and he should be selected with even greater care, the decision resting less with his own appearance and points (though these, of course, should be unobjection-

able) than with the character of his dam and *both his granddams*. The great cardinal principle of judicious breeding is expressed in the theory that 'like begets like *or the likeness of some ancestor*.' The more remote any ancestral imperfection may be, the less likely is it to reappear. But, in the case of a bull, on which so much depends, there should be no glaring defect in the dams for at least two generations back, and, of course, the longer the pedigree in which we can trace only first-rate cows, the better by far will be our chances of success.

"This suggests incidentally another point on which an erroneous opinion seems to prevail. It is considered of great advantage to a Jersey cow in America that she has a *short* pedigree. This is very well simply as an evidence of pure Jersey blood, but it has no other signification. If a reliable pedigree can be given and the purity of every ancestor proven for ten generations, the animal has, so far as purity is concerned, every advantage of an imported one; while the assumption is, and it will hold good in case of all our breeders who have kept accurate records for a long time, that the animal has been bred with more care, and consequently is intrinsically better, than one that has been bought in the market-place of St. Helier, without a pedigree or a history, and sold on arrival here for \$300 or \$400.

"One great advantage that it is hoped will result from the establishment of this Herd Book is, the intro-

duction of the elements of judgment and skill in the work of improving our butter-dairy cows. We shall henceforth be able to trace out the ancestors of animals offered for sale, and to learn something of their character; and we may have some better and more satisfactory guide in making our selections than the simple fact that the animal was bred on the Island of Jersey, and that it has a solid color and black points.

“Whether we have or have not now in this country better animals than are to be found in Jersey is a disputed question, but that we have here ample material for the development of such herds as Jersey never saw cannot be doubted. In fact, a recent visitor to the island has stated that such a thing as a *herd* does not exist there, even the most celebrated breeders keeping but from two or three to a dozen animals all told. The care given to the race in so limited a region, where careful inspection is not out of the question, has resulted in its great improvement; and there are doubtless individual animals that it would be difficult, if not impossible, to equal here. These are by no means the animals that are sold for exportation. That the Jersey breeders do not claim for themselves great superiority for the development of the race may be inferred from the following quotation from the Report of the Committee of the Agricultural Department submitted to the Royal Jersey Society in 1868: ‘The Committee beg leave to call public attention to the results of careful breeding as practised by Mr. P. Dauncey, Horwood

Rectory, Bucks, with his herd of Jersey cattle. These were sold, some time since, by auction, when sixty-nine head of stock realized a sum of 3136 guineas. For instance, a cow three years old was sold for 100 guineas; a two-year-old heifer, 60 guineas; a bull, one year old, 60 guineas.' In the same report it is stated 'that during the year one agent alone, Mr. Le Bas, had shipped from Jersey 2041 head, representing a value of £29,000;' also, 'That the first-prize two-year-old heifer at the last May show was sold in Jersey for £38; and the first prize in yearlings fetched at a sale £42.' While the sales from Jersey for exportation averaged about £14 per head, Mr. Dauncey's sale averaged over 45 guineas per head, and his best animals far exceeded the prices fetched for first-prize animals in Jersey, though there is no doubt, other things being equal, that the purchasers of the Dauncey stock (there being no Jersey Herd Book in England) would have preferred imported animals. The conclusion, therefore, is most natural, that Mr. Dauncey, working with material derived only from Jersey, far exceeded the Jersey men themselves in the value of his results. With a Herd Book to help us, with the encouragement of high prices for good animals and good butter, and with ample material to start with, there is no reason why we may not in time produce a stock better than has yet been known.

"The early importations of Jersey cattle into this country are most difficult to trace. The animals were then called Alderneys, and the same name was given

to Guernsey cattle, of which a goodly number were brought over, and they seem to have been interbred somewhat indiscriminately.

“The following is a copy of a paper kindly furnished by Col. Craig Biddle, of Philadelphia:

“‘The earliest record of an Alderney cow in Pennsylvania, that I am aware of, will be found in Vol. IV., page 155, of the “Memoirs of the Philadelphia Society for Promotion of Agriculture.” It is as follows:

“‘“I have upon my farm on the Delaware a cow of the Alderney breed, imported a short time since by Mr. Wurts. She has been fed in the usual way with potatoes, and during the last week the milk from her was kept separate, and yielded eight pounds of butter. The cow is a small animal, and is supported with less food than our ordinary stock.

“‘“By communicating this fact to the Society, it will oblige, etc.,

“‘“Jan. 11, 1817.

RICHARD MORRIS.

“‘“P. S.—The cow is three years old.

“‘“To ROBERTS VAUX, Sec. of the Phila. Society for Promoting Agriculture.”

“‘In a note on the same page, it is stated “that the cow above referred to is now in the possession of another member of the Agricultural Society; and after a fair trial made with her during last summer (1817),

the superior richness of her milk, when compared with that of other cows, has been fully tested. She gave $9\frac{1}{2}$ pounds of extremely rich, highly-colored butter per week."

"Another mention of the same cow will be found in the fifth volume of the same work, page 47, viz.:

" "GERMANTOWN, Oct 20, 1818

" " "With this you will receive a pound of butter made from the Alderney cow imported in 1815 by Maurice and William Wurts, and now in my possession. She calved on the 13th of last month, and is now in fine condition, running on excellent pasture of orchard grass and white clover, and gives on an average about 14 quarts of milk per day. From this quantity, during the week ending the 7th instant, we obtained 10 quarts of cream which produced 8 lbs. 2 oz. of butter, and the week succeeding $10\frac{1}{2}$ quarts, which gave $8\frac{3}{4}$ lbs. of the quality of the sample sent. You will perceive it is of so rich a yellow that it might be suspected that some foreign coloring matter had been added to it; but you may rely on it this is not the case. I may add that one of the good properties of this valuable breed of cattle is the ease with which the cream is churned, requiring but a few minutes to convert it into butter. When a proper opportunity occurs, I shall endeavor to ascertain the quantity and quality of butter to be obtained per week from the Kerry cow, imported this summer from Ire-

land, and the Brittany cow from France, both of which breeds I have pure.

““I remain, respectfully,

““REUBEN HAINES.

““RICHARD PETERS, Esq.”

““In September, 1840, three Alderney cows were purchased by the late Nicholas Biddle. They were imported from the Island of Guernsey, and brought to the port of New York in the schooner *Pilot*, Captain Beleur. They turned out to be remarkably fine animals. This stock, crossed by later importations, is maintained in its purity at Andalusia, Bucks County, Pa., the country-seat of Mr. Biddle, and still in possession of his family.’

“The earlier importations made by Mr. R. L. Colt, of Paterson, N. J., were of Guernsey animals, or at least there were Guernsey animals among them. About fifteen years ago, he became satisfied of the superiority of the Jersey stock, and disposed of his Guernseys and made fresh importations. It has been alleged that the importations made by Mr. Cushing, of Watertown, Mass., were in part Guernseys; but this has been authoritatively denied, and the Cushing herd has been proven to be of pure Jersey stock. The Guernsey animals in these earlier importations have been a source of great annoyance to the Committee in passing upon animals offered for entry. In many instances, fine animals, carefully bred, and believed by their owners to be pure Jersey, have had to be rejected because remotely

tracing to the Biddle or the earlier Colt importations. Their rejection was, of course, no criticism on their quality.

“The call for contributions for this essay was responded to by only two or three members, and it has seemed best to allow what they have written to influence the character of the essay rather than to be quoted into it with unavoidable repetition.

“The request has been made that particular points in breeding and management might receive especial attention; the idea being advanced that white color indicates a deterioration of health, but there seems no sufficient foundation for the belief to warrant its incorporation here. On the contrary, from the polar bear to the white bantam, all races that are wholly or in part white seem to afford ample evidence of the entire compatibility of vigorous health with the absence of color. That color has a physiological significance is not improbable; but what that significance is we are far from being able to say, and the practical relation of all such intricate physiological questions must be referred to a more advanced state of knowledge than our own. In like manner it has been stated that a bull whose tongue is black is more likely than another to impress his own characteristics on his offspring. A careful investigation of the evidence, which is within the reach of all, will surely prove that this theory is entirely without foundation. So long as black-tongued bulls beget white-

tongued calves, and white-tongued bulls beget black-tongued calves (the dams being of the same color in both cases), the evidence essential to uphold the theory seems to be wanting.

“It has been also suggested that this essay should include a treatise on the management of Jersey cows. Except with reference to their breeding, there seems to be no necessity for treatment different from that which all cows require, and to introduce a comprehensive article on dairy farming would be unnecessary, and would add too much to the size of the Register.

“If this breed has any peculiarity that requires special care, it is the persistence with which its better specimens hold out with their milk while pregnant. This tendency is surely to be encouraged within reasonable limits. If a cow can be made to yield a fair flow of milk up to within four weeks of her calving-time, and need go absolutely dry but two weeks, there is no question of the advantage of her doing so. That she should milk up to the very day of calving indicates certainly a good milk-making tendency; but it is at least not proven that such constant milking is not injurious. Persistent milking is a characteristic merit of the better class of Jersey cows, and it is of immense advantage, not only in the case of a single family cow, but in those used for the butter dairy. It is in all respects better that a cow should commence her flow at 10 quarts and not fall below 5 quarts a month before calving, than that she should give 20 quarts the first month, 10 quarts

the third, and fall to 5 or 6 quarts when three months gone with calf, and to nothing two months later.

“But few contributions have been made by members as to the butter-making quality of Jersey cattle. About two years ago, Mr. Charles M. Beach made a careful experiment with three pure Jersey cows, three grade cows, and three native cows, an experiment which was carefully conducted for a week. The animals were in essentially the same condition, and were kept on the same food. Each lot averaged about the same time from calving. It was found that to make one pound of butter the following quantity of milk from each sort of cow was required:

3 Pure Jerseys.....	6 $\frac{1}{3}$ quarts.
3 Grades.....	8 $\frac{1}{4}$ “
3 Natives.....	11 “

“According to this, a Jersey cow giving about 12 $\frac{2}{3}$ quarts of milk per day, or a grade giving 16 $\frac{1}{2}$ quarts, would make as much butter as a native cow giving 22 quarts per day.

“Mr. Thomas Motley makes the following statement of the product of butter of the Jersey cow Flora, imported by him May 25, 1851 (then two years old). Her first calf was dropped June 18, 1851; the second, June 3, 1852; and the third, April 28, 1853. Her butter was made by itself, and carefully weighed for nearly a whole year (fifty weeks). The total was 511 lbs. 2 oz., or an average of 10 $\frac{1}{5}$ lbs. per week.

“Mr. Motley states that this cow was not forced in

any way. She had only ordinary feed, winter and summer—good feed, of course, and systematically administered, but nothing to so stimulate her secretion of cream as to impair her subsequent usefulness. Surely a breed to which such immense results are possible is worthy of our most fostering care, and we should jealously guard against sacrificing this possibility for the sake of fancy-color points. A herd of cows that would average five hundred pounds each of Jersey butter a year might be of all the hues of the rainbow without losing popularity.

“Mr. Motley also reports the following trial with the same cow during the latter part of her previous milking: ‘I tried her milk, placed by itself for one week, measuring the milk, and weighing the cream and butter. February 3, 1853, 40 quarts milk gave 10 quarts cream, weighing $25\frac{1}{2}$ lbs., and 7 lbs. butter. February 9, $38\frac{1}{2}$ quarts of milk gave $9\frac{1}{2}$ quarts cream, weighing 23 lbs., and $7\frac{1}{2}$ lbs. butter—5 quarts and 1 pint of buttermilk, weighing 15 lbs. She calved on the 28th April following, two months and nineteen days after the trial.’

“Mr. J. Milton Mackie writes, under date January 30, 1870: ‘Having lately obtained a set of glass tubes for testing the quality of milk, I have got results as follows: A two-year old heifer (dropped April 2, 1867), which dropped her first calf June 11, 1869, showed $3\frac{1}{2}$ inches of cream on a column in a tube of 11 inches (milk and cream together). This is 31·80 per cent. of cream. The milk was poured from the pail as soon as

drawn from the cow, not allowed to stand for a single minute. The amount of cream was measured in the morning after the milk had stood in the tube between fourteen and fifteen hours. The tube stood in the milk-room at the usual temperature for setting milk in winter. The cow had been fed as usual that day, and for days before—say about two quarts of mixed bran and feed per day, on cut hay, with a little oat-straw. I may add that this heifer had been milked on the morning of the day of trial as usual. I know of no reason why this experiment is not in all respects a fair one.

“‘The mother of this heifer was tested in the first days of November, 1866, immediately after having been purchased, and yielded 1 quart of cream from $3\frac{1}{2}$ quarts of milk, fed only on grass, and short at that. The average yield of my Jerseys, tested by the tube yesterday (January 29), was 20.45 per cent. of cream, after standing less than fifteen hours.’”*

“The age at which Jersey cows should calve seems by common consent to be fixed at two years. If allowed to go much longer, they seem to lose something of their natural tendency to lactation. The precocity of the breed, however, is so great that, unless care is taken, they sometimes come in much earlier. Mr. Mackie writes, under date June 3, 1870, ‘My yearling “Hebe 4th,” out of “Hebe 1st,” by “Cliff,” dropped a calf last

* The heifer in question gave $3\frac{1}{2}$ quarts per day at the time her milk was tested. The herd gave four quarts on an average. Of course, the proportion of cream was very large, as the herd was drying off

month, when she was only 14 months and 2 days old. She calved without trouble, behaved well in every respect; has given since about 6 quarts of milk per day. . . . She is thrifty, and I don't think the labors and duties of maternity so early imposed upon her will injure her growth in the least. The taking the bull was accidental; but I am not sorry for the accident. The calf is of fair size, thrifty and handsome.'

"It seems a valuable suggestion that heifers be made to come in with their *first* calves during the very flush of spring grass, when their newly used lacteal organs will be stimulated to the largest possible development.

"In closing this brief collocation of facts and opinions concerning the influences under which the Jersey breed of cattle has been produced and developed, and the manner in which, by adhering to or deviating from the conditions thus indicated, the race may be still modified or improved, it is regretted that the material was not at hand to make it more complete. Further contributions are requested for the next volume of the Register."

CHAPTER II.

HOW TO CHOOSE A GOOD COW.

HAVING, in the first chapter, expatiated on the peculiar fitness of the Guernsey and Alderney Cow for the purposes of milking and breeding, it follows that I should now give such instructions to purchasers as may enable them to choose a good, serviceable animal.

Commencing with the general configuration, it is necessary to observe that, as the cow under consideration is a high-bred animal, very nearly the same general characteristics should be observed as exist in a well-bred horse.

The head should be small, slender, and lengthy from the eye to the nose; the horns thin and open, not cramped, or, as it is frequently expressed, too curly; the eye full, but not too prominent, the latter quality indicating an excitability and consequent restlessness of disposition that is not favorable to the production of milk; the ear lengthy and broad, and well fringed with hair, which protects it from the annoyance of flies and indicates a strong constitution. A broad muzzle should be avoided, as showing a tendency to fat. The neck should be long, flat and narrow, with a tendency to rise at the withers, and breadth behind the arm to allow of

a full expansion of the lungs, the chest being rather deep than broad; the flat-sided cow is more especially to be chosen as a milker. The hips should be wide, rugged and high, and the pelvis (or haunches) wide and large, drooping toward the tail; the thigh long and lean from hip to hock, the veins being prominent and easily felt; the legs slender, with flat bone and small, flat feet, the hinder ones having good width between, to afford room for the udder. A long and thin tail is a great point in breeding.

I now come to the udder, to which all former remarks are secondary. This part, the reservoir of the milk, should be free from hair, flexible and soft, with no tendency to flesh; the bag extending well forward, as level as possible with the belly, and high up between the thighs. The feeding veins should be particularly observed. In the heifer with the first calf they must be felt for with the hand; in this case two holes will be discovered by feeling under the belly nearly in a line with the navel, on each side, in good milking heifers, of about the size of a sixpence. As age increases the holes extend, and the veins become large and easily perceived by the eye; the larger these feeding veins appear, the greater is the quantity of milk. The teats should be well separated, not fat or fleshy, and not too long, but sufficiently tight to retain the milk, having a tendency downward—that is, to use the technical term, not *strutting*, or pointing away from the quarters, as this causes waste of milk and difficulty in milking. These

particulars combine all that in ordinary use require to be attended to in the selection of a serviceable cow. There are, however, some few remarks to be made on the hide, which will be found useful in determining the fitness of particular cows for particular localities, but having little to do with the milking properties. If possible, it is better to accustom a cow to cold and exposure by degrees, in which case the hide will adapt itself to the altered condition by thickening and producing more hair; but when this gradual adaptation of the animal to a new and more severe climate is impracticable, choice should not be made of one possessing that great delicacy of skin and covering which is so much coveted, but of one having coarser and more curly hair and thicker hide, which features are indicative of a customary exposure, when the other points show good milking properties.

A good cow not only yields much good milk, but almost in proportion to the quantity given daily is there a long continuance of the secretion between the periods of calving.

How much milk will a cow yield? In general terms it may be said that a cow yields far more than she needs to rear her offspring, and in some counties two calves are made to suckle one cow, or the milk of one cow is given even to more than two calves when these are reared exclusively by the hand. It is extraordinary how much a young animal will drink, and no doubt the function of the udder is most active when

the natural stimulus—the act of sucking—is in full operation.

Some cows yield enormous quantities, and I am really inclined to regard the very extraordinary drain occasionally occurring by the udder of a poor lean cow as unnatural and unhealthy. It is not unfrequent to see in large dairies an emaciated animal, with every indication of great constitutional weakness, and even the unmistakable signs of phthisis, yet yielding gallons of blue watery milk. We frequently observe secreting organs, from some cause or other, unusually active, much to the injury of the animal's health, and sometimes fatal effects result. This is the case in different forms of diabetes, and the persistence of a poor milk secretion to the last moments of an animal's life, months and months after it should naturally have ceased, may really be regarded as an abnormal state. At all events, this view of the subject is worthy of consideration.

Long continuance of mammary secretion may depend on the system adapting itself with difficulty to a great constitutional change. When a cow is in calf, the development of the foetus calls for blood which is drawn from the udder, and the function of the latter ceases. If, on the other hand, a cow that is not pregnant lays on flesh, the deposition of fat necessarily restrains the production of milk. But the transudation of principles from the blood in the mammal becomes in the course of time little more than a mechanical process; and provided the materials entering the blood are not stored

up in some other form, they are very readily transformed into the elements of milk, from the system having become long habituated to the peculiar changes essential in this process. Accordingly, some good milkers, and particularly old cows in which vital activity is constantly decreasing and systemic reaction becoming progressively more and more difficult, acquire a sickly appearance, the defective lymph is deposited in the form of the masses of tubercular matter so constantly found in the chest of old cows, the animals become phthisical, the organs of procreation become unhealthy, and with more or less constant irritation of the ovaries the cow becomes barren. With this irritation there is a periodic check to the secretion of milk; nevertheless a very considerable flow continues, notwithstanding the obvious waste of every tissue in the animal's body.

The fact that the system is more capable of undergoing natural, though very marked, changes in early life without danger, renders a young animal indispensable for the dairy, either to breed from or to prove profitable to the town cow keeper.

TO DETERMINE THE AGE OF A COW is therefore a matter of importance, and this can be done with great precision by examining the teeth and horns.

The horns do not furnish us with such certain indications as the teeth, and great facilities are offered in some animals to destroy the marks of growth and age.

According to the breed does the length, thickness,

and shape of the horn vary, but in all there is an annual mark left of continual development. In castrated animals the horns sometimes attain extraordinary proportions, but this in no way affects the appearances I have to describe.

Shortly after birth the development of the frontal processes on each side of the head indicate the position of the future horn, which appears through the skin within the first month. At the age of four or five months the little horn is firm, and protected by a scaly cuticular covering, which exfoliates when an animal is about a year old. At this period the base of the horn becomes knotty, and a circular depression between the skin and the bulging horn is the sign that the animal has fully attained its first year. A second bulge forms, and a depression below it, by the second year, a third by the third, and so on as long as the animal lives.

But, in calculating the age of a cow at five or six, an error may be incurred by supposing that the first marks formed can be readily perceived. It is only the third year's circle which is very distinct.

The teeth of animals develop with great regularity, and indicate, by periodical changes, how long they have been growing. So universal are these marks of age amongst the lower animals, that an attempt has been made to determine by the teeth the age of human beings. But an artificial existence, with circumstances occasionally favoring a tardy development, and at others a very rapid growth, completely set at naught any tables

which may be framed, and the exceptions are too numerous to admit of accuracy in calculations.

The age of the ox cannot be determined with so much precision as that of the horse, from the diversity in the precocity of different breeds, as well as the very various methods of management they are subjected to.

The obvious changes of the teeth have been divided into two epochs. The first consists in the eruption and wear of the temporary teeth, and the second the eruption and wear of the permanent teeth.

First Epoch.—There are two periods in this epoch—the one from birth to thirty days, and the second up to eighteen months. A calf is usually born with four incisor teeth through the gums. In tardy animals the four appear within the first four days, the next two about the fifteenth day, and the fourth pair from the fifteenth to the twenty-fifth day. The second period of the first epoch consists in the wearing down of the temporary teeth, which occurs successively from the centre to the corner teeth, so that all are much worn by eighteen months.

Professor Simonds says, “The putting up of the temporary incisors and molars at about a month completes ‘first dentition;’ and as there is now a given number of teeth, so any addition to them will make an important stage in the further process of teething. When this addition takes place, the temporary teeth, merely by their number, cannot avail in our inquiries, nor can they be said materially to do so up to that period by the

slight wear they may have undergone. The general appearance of the young animal for the first few months suffices to form a fair estimate of its age."

The second epoch, or "second dentition," includes three periods. The first consists in the successive eruption of the permanent teeth.

In referring to the ox's mouth at eighteen months, Mr. Simonds says it has been shown that at a year old the four middle placed incisors, in particular, give indications of wear by the loss of their sharp edges, and increasing flatness of their crowns. "By eighteen months this flatness has considerably increased; it is not now, however, confined to the teeth placed in the centre of the mouth, but has extended to all. The jaw of the animal has also grown wider, thus increasing the spaces between the teeth, so as to leave not merely their fangs apart but likewise their crowns. To compensate in part for their diminished length, the teeth have likewise risen in their sockets; and as some of them are soon to be renewed by the permanent incisors, the powers of absorption have commenced in their fangs. These various causes, more or less modified in different animals, give to the mouth an appearance which is quickly recognized."

I may remark that the indications of age here given for eighteen months I have seen in backward breeds at twenty or twenty-two months, and, as Girard says, the middle permanent incisors are then out at two years; the next two, between two and three; the next two,

between three and four; and the next, between four and five, when the full complement of permanent teeth is observed in the mouth. But undoubtedly this eruption often occurs far more rapidly.

The second period of the second dentition is that in which the incisor teeth undergo a manifest change in their wearing aspect, whereby the age of a cow can be told. This period extends from five to nine years of age, and annually each succeeding pair is observed worn down.

In the third period of the second dentition the form of the teeth completely alters; the upper surface becomes progressively narrower and flatter. The teeth become very short and detached from each other, until in extreme old age they fall out.

In the upper jaw, the ox tribes possess no teeth, but a pad to apply against the incisors. In early life the rudiments of teeth are observed springing from the intermaxillary bone, but a tough fibro-elastic cushion, covered by the firm mucous membrane, becomes consolidated as the animal acquires age.

I have not referred to many accidents which affect the regularity of growth and eruption of the worn teeth of cows, but they are very common. Thus a temporary tooth may be prematurely removed when an animal is biting some tough root, or a tooth may be knocked out. The early removal of a temporary tooth does not always ensure the early appearance of a permanent one, and this is seen in some Yorkshire colts which have disap-

pointed the hopes of their tricky masters, who, in attempting to make a horse look old by drawing some of his teeth, in order that they may be believed to have been shed, retards the growth of the teeth that are to replace them. The pressure on the permanent tooth as it advances to displace the temporary produces a certain degree of irritation, and a determination of blood to the parts favorable to the development of the former.

Mr. Simonds says, "Among the anomalies which are met with in the teething of oxen, the cutting of one tooth of a given pair four or five weeks before the other is the most frequent. The tooth thus put up out of regular order is likely to lead to an error with reference to the animal's age. My own observations go to show that in most instances it is a premature cutting of the one, and not a delay in the coming up of the other tooth, which produces the anomaly; and consequently that the animal is younger than he appears to be at first sight. I have noticed that this irregularity applies far more frequently to the third and fourth pairs than to either the first or second."

TO DETERMINE THE MILKING QUALITIES OF A COW, many important points have to be considered. We shall classify them under two heads: Constitutional or rather Systemic Characters, and Local Peculiarities of the Mammary Glands.

Whether destined for the production of flesh or milk, the cows of any breed may possess the distinguishing

features of milkers—the comparison as to superiority or inferiority being instituted between animals of the same breed. Nevertheless, the good dairy cattle possess such a development of good milking points, that, regardless of other tests, we can from these determine to a great extent if belonging to a milking breed.

The head should be clearly distinguished from that of a bull by lightness, sharpness of outline, clean bone, well developed skull, with broad forehead and well mounted horn. I do not like a long-faced cow with narrow cranium, heavy brow and thick prominent muzzle.

The neck varies very considerably in different breeds. It should be light, of moderate length, with a nice curve, so that the head when raised appears prettily held.

From the withers to the root of the tail, the spine should be straight and broad. The withers round and broad, the loins wide, and, according to some, the spinous processes of the lumbar vertebræ should bend well forwards, so as to leave space between them and the spinous process of the sacrum.

A good back is usually seen with a good body, deep and prominent ribs well back towards the ileum, and not only allowing free play for the heart and lungs, but room for the digestive and reproductive organs.

The belly in young animals should be neat and round. It droops with age, especially when a cow has borne several calves.

The limbs should be well proportioned, the fore ones light, especially towards their upper part, and the hind

ones broad, with full flat thighs, broad clean hocks, straight and short legs.

The skin should be free, thin, and may be covered with hair of any color, according to the breed. In some, as in the Jersey cattle, a light color is preferred. Amongst Brittany cows the light-colored cows are usually coarse, wild, and unproductive. The black and white cows are preferred. Amongst Ayrshires a good reddish brown and white cow is considered the best. Color is of little value to determine quality, especially in comparison with the nature of the skin. I have never seen a cow with a really good skin a good milker. It is as certain a sign as most of the more generally reputed ones. In some instances the hide is fine, and feels thicker than it really is, from the unhealthy condition of a cow. I know of no fault I dislike more than really thick skin.

The tail is by some much looked to, and it is believed that when fine, and reaching down to the hocks, with a fine tuft of hair, it is associated with other good milking points.

It is an essential quality in a cow that she should be good tempered, lively, and in such constitutional vigor as to feed well, ruminate much, and thrive well. The perfect state of the digestive system is a very important matter. And we have before said that a good conformation of chest, indicating great power of the respiratory organs, is much to be desired. All these qualities render an animal constitutionally strong, and

enable it to yield milk to the full extent of its milking qualities.

The udder of the cow is constituted by four or six mammæ, two or three on each side. Rarely do we find more than four secreting, and they are therefore called the quarters of the udder. The whole of the quarters are in the cow enveloped by a common fibrous tunic, tough and elastic, connected with the abdominal fascia by similar fibro-elastic textures. This outer envelope is closely adherent to the skin, and on its glandular aspect is connected with numerous prolongations or septa intersecting the gland and supporting its different lobes and lobules. The tube passing through the teat or nipple may be regarded as the stem connected with a considerable cavity, and from which spread many branches; these traverse the substance of the organ in every direction, and are connected with clusters of gland vesicles. Like all compound racemose glands, they may be compared to bunches of grapes, the acini or grapes being connected by areolar or connective tissue, which constitutes the framework or skeleton of the organ, and is transformed into or continuous with the outer fibro-elastic envelope.

The teat itself, composed of the outer skin, of a fibro-vascular and partly erectile tissue, possessed also of considerable muscular contractility, is traversed through its centre by the milk duct, communicating, as I have before said, with a milk reservoir, and through it with every other tube in the gland. The tubes which con-

verge towards the milk reservoir have received the name of Galactophorus ducts.

The different quarters of a cow's udder are supplied by separate arteries with blood. In company with these arteries are numerous veins, the development of which is very marked in some cows. The udder veins discharge their blood in great part into the thigh vein, but also in the abdominal vein, which sometimes attains such a considerable size.

The udder of a cow may be very large, from an abundance of the areolar or connective tissue above mentioned. This constitutes a "fleshy" udder, and is not a desirable quality. If the gland be firm and rich in gland vesicles, with a nice fine skin, it is much to be preferred.

The fore-quarters of the udder should advance well under the belly, and the teats pointing obliquely outwards. The back-quarters well up behind and broad.

With regard to the veins as indications of milking quality, we can rely less on the so-called "milk vein" than is often supposed. If large and tortuous, with a considerable opening through the muscles of the belly to admit of its passage outwards, it is frequently connected with a rich udder; but far greater reliance can be placed on the network of veins seen beneath the skin over the fore-quarters of the udder. This characteristic is little noticed by authors, and I have rarely heard dairymen or dealers in cattle speak of it. But both the veins and the udder itself, and those which pass up-

wards behind towards the tail, in fact over the perinæum, when large, are sure tests of a competent milker. Magne has noticed this mark more than other persons, though our own numerous observations, which agree with Professor Magne's, date several years back. I cannot refrain from quoting his remarks:

"Veins of the Udder and of the Perinæum.—The veins of the udder and the perinæum, to which hitherto sufficient importance has not been given, are able to furnish valuable indications. They should, in both cases, be highly developed, large and varicose; that is, exhibit inflations and nodosities.

"The veins of the udder have no definite direction. They present themselves very irregularly, under the form of zigzag lines, knotted, and more or less oblique. They are never of very large size, except in cows which give great quantities of milk.

"The veins of the perinæum directed from above downwards, forming a winding line, interspersed with knots, resemble those of the udder in not being visible either in heifers or in beasts of middling quality. We cannot ascertain their presence in any but very good cows.

"In the cow on which we saw the vein of the perinæum for the first time, in the vicinity of Lille, in 1847, in company with MM. Delplanque and Pommeret, this vein formed a very large knotted and winding line. The Dutch cow which had it, though not of large size, gave seventy pints daily, and did not become dry while

in calf. All the surface of the udder was varicose, interspersed with transverse veins.

“ Since that particular case drew our attention to this mark, we have had opportunities of observing it on a very great number of cows. M. Collot also gives this vein as one of the marks of excellent milkers.

“ The veins of the perinæum, in the best milkers, form a network beneath the skin, which it raises up in a greater or less degree. In some of the best cows, these veins mark their position by a large knotted line, but most frequently, in order to make them visible, it is necessary to use pressure across the skin at the base of the perinæum. The pressure causes them to swell, and makes them discernible both by sight and touch. It is even easy, by making the blood flow back towards the *vulva*, to produce very apparent undulations.

“ We should always pay attention to these movements of the blood, in order not to mistake the folds, sometimes exhibited by the skin of the perinæum, for veins. Error is especially to be feared in the case of fat cows, on account of the fatty inflations which appear in the perinæum. The veins buried in fat cannot be distinguished by the motions of the blood, which often are by no means apparent.

“ In some cows, the vein is found between two folds on each side of the perinæum; it is there much less prominent than the folds, and becomes perceptible only by the fluctuation of the blood.

“ At other times (this is when the perinæum is united,

when the skin is thin, and the cow old), the veins, though little developed, are apparent, or easily become so, without being very bulky. It is necessary to have regard to their size; though they may be very easily detected, still, if they are small, the cows are not very good.

“It is not always on the upper part of the perinæum, near the *vulva*, that the vein is most visible; sometimes it is discernible only in the lower part of this region, near the udder; it there appears under the form of knots, which are, at times, very large, and are observed on the perinæum and the udder, and the space between them.

“Of all the marks of abundant milk secretion, the best, and indeed the only infallible marks, are furnished by the veins of the perinæum and of the udder. But, although the surest, they are not absolutely decisive.

“To estimate them, it is necessary to take into account the state of the cows in respect of flesh, the thickness of the skin, food, general activity, fatigue, journeys, heat; all the circumstances, in short, which cause variations in the general state of the circulation, and in the dilatation of the veins. It is necessary, moreover, to recollect that in both sexes all the veins are larger in the old than in the young; that the veins which encircle the udder are those which, if the cows are in milk, vary most according to the different periods of life; though scarcely apparent in youth, they are of considerable size when, after several calvings, the operation of milking has given the gland its full development.

“This proportion between the size of the veins and the milk secreted is observed in all females, without exception. The largeness of the veins and their varicose state, being a consequence of the quantity of blood attracted by the activity of the milk glands, is not only the sign but also the measure of this activity; the connection between the two phenomena is such that, if the glands do not give an equal quantity of milk, the larger veins are on the side of the gland which gives the larger quantity.”

There remains for me to notice the most valuable of all methods to determine the milking qualities of the cow. It is Guenon's system. François Guenon, risen from the humbler classes, and from his boyhood being amongst milch cows in his native country in the vicinity of Bordeaux, narrowly observed the relation between the amount of milk secreted and the development of the patch of skin, covered with upturned hair, extending from the udder upwards, and laterally over the thighs. He determined from this that it is possible with great accuracy to determine the value of a dairy cow.

For long was Guenon's system a secret. His career has, however, been most fortunate, and the substantial manner in which he established his claims as a discoverer in this very important matter has insured him much distinction.

“The Agricultural Society of Bordeaux appointed a committee, in 1837, to test Guenon's capabilities, and they reported that, although the mode by which he

ascertained these qualities was a secret, he had succeeded in satisfying them of the reality of the system he pursued. They subjected his process to an experimental test which was very effectual. Separate cows were brought from strange dairies, and he wrote down the characteristics and qualities of each. These were compared with the separate statements given by the owners of the animals ; and, in cases of more than sixty head, he succeeded in stating all their peculiarities exactly, excepting a very slight difference in appraising the quantity of milk—a difference the committee attributed solely to the quality of food given to the animal.

“The Central Society of Agriculture of Cantal also reported upon his system with equal favor. They thus describe the process of investigation pursued: ‘He accompanied the members of your committee to the farm of Verac, belonging to the president of the society. He examined with scrupulous attention the fine dairy cows of this domain, which is composed of one hundred milch cows of the best kind in the country. . . . M. Guenon gave upon each of them separately precise indications as to the quantity of milk each of them gave per diem, and the length of time they would hold their milk after being again in calf. We must avow to you, gentlemen, that they have almost in every instance agreed with the declarations of the owners of the cows.’ ” *

M. Magne tells us, that from time immemorial the inhabitants of Mont d’Or, in the Lyonnais, of the com-

* The Cow. By M M Milburn London, 1859.

munes of St. Cyr, St. Didier, Conzon, etc., have considered the tufts or fringes on the lateral parts of the belly and at the base of the flank as indicating the milking qualities of goats. Guenon has founded a system on a similar basis, applicable to the cow; and all animals bear similar indications of aptitude for the secretion of milk.

It is not very easy to denote intelligibly the whole system, in order to adopt it without further guide; this, however, applies to all matters of observation, in which a single practical demonstration proves more instructive than the perusal of a considerable volume. It has been stated, in disparagement of Guenon's system, that no one has attained his proficiency in selecting cows according to his method. We very much doubt this, as we have seen it applied with the happiest success by several of Guenon's countrymen. All seem to think his classification too complicated; but it may be so for those who will not take the trouble to study it thoroughly. I confess, however, that I am inclined to give weight to this objection to Guenon's treatise.

In introducing his subject, Guenon says, "I affirm without fear of erring that, with an accurate knowledge of the new characteristic signs of my method, the animals which will give most milk, and continue longest yielding it when in calf, can be chosen even a few days after their birth; the quality of the milk, whether it will be rich or poor in cream or butter, can also be determined."

The distinctive signs which Guenon makes use of are, the *tufts* or *epis*, and *scutcheons* or *ecussons*; they are visible in all animals of the bovine race, without exception; are situate over the perinæum and inner surface of the thighs, and can only be examined thoroughly during the animal's movements. These signs characterize the class and families, which only differ from each other in the variable form of the scutcheon; Guenon, moreover, says that the names he has used are purely conventional, having relation to the form of parts employed as signs, and he has especially avoided Greek and Latin compounds.

Ten forms of scutcheons have been described, and constitute the basis of Guenon's classification.

The surface of the scutcheon is distinguished by the hair turned upwards, and opposite in direction to that

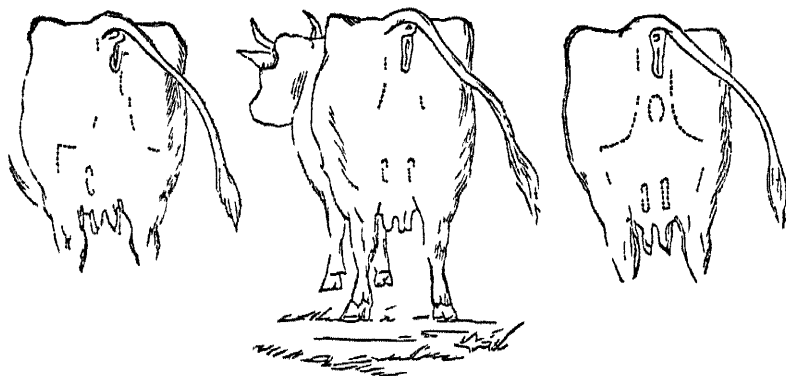


Fig 1.

Fig. 2.

Fig 3

covering other parts of the animal's skin. This hair differs from all the rest in color, and is fine, soft and close.

The scutcheon springs from the middle of the four teats, whence a portion of its hair springs, and extends

towards the navel, whereas the other part rises towards the inner and upper part of the hocks to the middle of

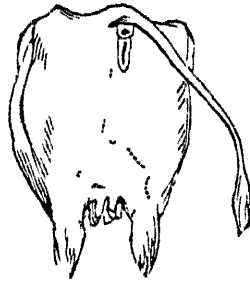


Fig. 4.

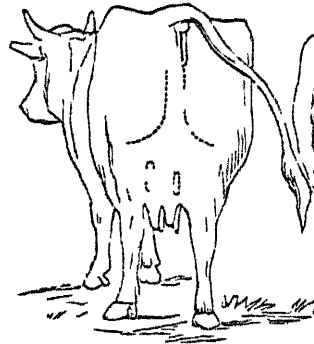


Fig. 5.

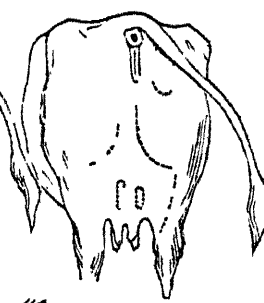


Fig. 6

the posterior surface of the thighs; then rising over the udder on the perinæum, it extends in some classes to the upper angle of the vulva, as seen at figs. 1 or 3.

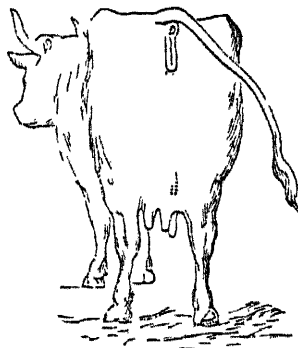


Fig. 7.

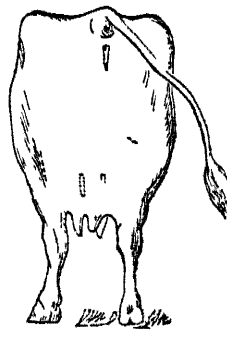


Fig. 8.



Fig. 9.

The surface or extent of the scutcheon denotes the milking capacity, its form and outline indicate the class, the fineness of the hair and the color of the epidermis the quantity and quality of the milk.

In examining scutcheons, Magne says:

“For the most part, it is very easy to distinguish the scutcheons by the upward direction of the hair which forms them. They are even sometimes surrounded by

a line of bristly hair, turned backwards, and formed by the meeting of the upward and the downward hair.

“Still, when the hair is very fine and very short and mixed with long hairs, when the skin is much folded, and when the udder is of large size and pressed by the thighs, it is necessary, in order to be able to distinguish the part enclosed between the udder and the legs, and perceive the full size of the scutcheons, to examine them attentively, to place the limbs of the cow apart, and even stretch the skin in order to efface its folds.

“The scutcheons may also be perceived by leaning the back of the hand against the perinæum, and then drawing the hand from above downwards. The nails rub against the ascending hair, and give sensible indication of the parts covered by it.

“As the hair of the scutcheon has not the same direction as the surrounding hair, it may sometimes be distinguished by a difference in the shade reflected by it; but for the most part it is thin and fine, and allows the color of the skin to be seen. Were we to trust only to the eye, we should often be deceived.

“In some countries dealers shave the buttocks of cows. Immediately after this operation, it becomes impossible to discern the tufts, either by sight or touch; but the inconvenience ceases after some days. We ought to add that this shaving, intended, as the dealers say, to beautify the cow, is resorted to most frequently for the single purpose of destroying the scutcheon, and

depriving buyers of one method of determining the milking qualities.

"It is superfluous to add, that the cows most carefully shaven are those which were ill marked by the tuft, and that it is therefore prudent to assume that cows with the perinæum shaved are bad."

Guenon says that the importance of the scutcheon is sometimes diminished, and at others increased, by the different tufts which are usually met with, according to their form, nature, position and extent. With the exception of the oval ones, seen at fig. 1, all tufts encroaching on the scutcheon diminish its value, or in other words indicate a diminished aptitude for yielding milk. Another tuft serves to distinguish the good from the bastard* cows. It exists on either side of the vulva, as seen in fig. 2.

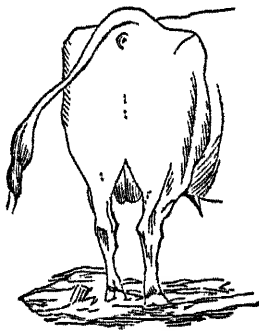


Fig. 10.

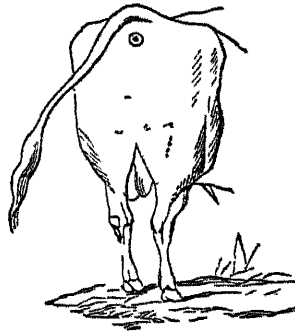


Fig. 11

When the scutcheon is well formed and fine, the individual bearing it belongs to the first or second order of its class; but when the scutcheon is occupied over a portion of its surface by certain *epis* or tufts, the animals descend one or more orders in the classification.

* By *bastard*, Guenon means cows which differ from a certain class only in a deviation in the natural form of the scutcheon or position of tufts.

If the scutcheon be wider about the vulva than below, the medium width through its whole extent is estimated, and this represents the value of the scutcheon and the order of the cow.

All variations in the hair of the scutcheons are tufts which constitute irregularity or indicate a fault in the interior which affects the secretions of milk. The fault is in relation to the superficial extent of the tufts. As Magne says, "the tufts being valuable in proportion to the space which they occupy, it is of much importance to attend to all the rows of descending hairs which lessen its size, whether these occur in the middle of the scutcheon or form indentations on its edges. These indentations, partly concealed by the folds of the skin, are sometimes perceived with difficulty. It is of much importance, however, to take them into account, for in a great number of cows they greatly lessen the size of the scutcheon. We often find cows which at first sight appear to have a very large scutcheon, and yet are only middling, because lateral indentations greatly lessen the part of the skin covered with ascending hairs. Many blunders are committed in estimating the worth of cows because sufficient attention is not paid to the real size of the scutcheon."

Guenon, moreover, says, "in general, when a tuft is seen on the scutcheon, either on the right or left of the thigh, we know that the veins situated beneath, on either side of the belly, have a peculiarity; the one on the side of the tuft where the scutcheon is contracted is small,

and there is also a small opening for it where it pierces the abdominal muscles.

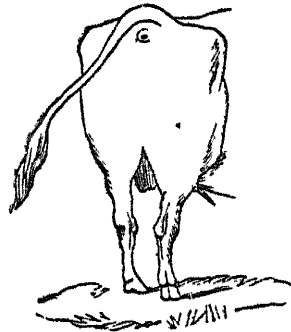


Fig. 12.

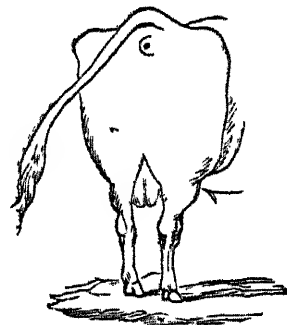


Fig. 13.

The tufts and scutcheon are best seen and appear to open out at the time of calving, and become contracted again shortly after the cow has been delivered. They are best seen also on fat cows.

Sometimes there is an intermingling of two forms of scutcheons. This depends on the crossing between a cow of one class and a bull of another. There are difficulties to encounter, then, in precisely estimating the value of the animal.

Before stating the varieties of scutcheons described by Guenon, I must mention that the tufts, or encroaching patches of hair, which modify the scutcheon, have

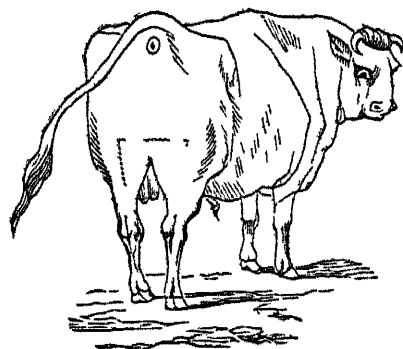


Fig. 14.

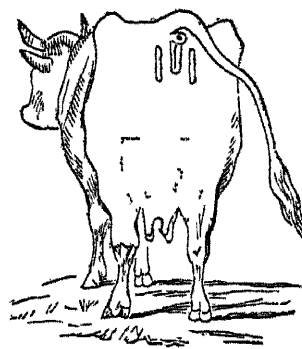


Fig. 15.

been classified. There are two species—those on which the hair ascends, and those on which it descends. Those with ascending hair are simply traces which encroach on the descending hair outside the scutcheon, either on one side or beneath the vulva. Those with the descending hair are on the scutcheons, and are five in number.

The seven tufts or patches of hair which Guenon thus mentions are placed as represented below.

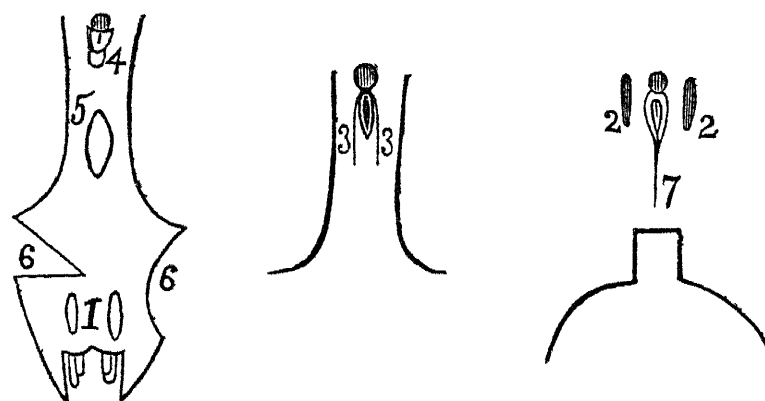


Fig. 16.

The names given to them are very peculiar, and for some we must substitute another in English, taken from the position or form of the tuft.

Thus, 1. *Epi ovale*, oval tuft; 2. *epi fessard*, ischiatic tuft; 3. *epi babin*, lip-shaped tufts; 4. *epi vulve*, vulvan tuft; 5. *epi batard*, perinæal tuft; 6. *epi cuissard*, thigh tufts; and 7. *epi jonctif*, mesian tuft.

The oval tufts are good signs if small, regular, and covered with fine hair. They are seen in all the best cows, but they are also met with in some of the lower orders.

The thigh tufts of ascending hair are never seen in

the first-class cows, but in all others to a limited extent.

The 3d, or lip-shaped tuft, is only seen as a sign of deterioration in the two first classes; it is constituted by descending hairs, and is an indication of defect, in its special class, so far as milking qualities are concerned.

The 4th is likewise a deteriorating sign.

The perinæal tuft may exist in cows otherwise well marked, but it indicates that the animal will have a great diminution in the amount of milk it yields so soon as it becomes pregnant.

The thigh tufts indicate a diminution in the yield of milk proportionate to their extent.

The mesian, or dart-like tuft, with soft, silky, ascending hair, is rarely seen, and only in those classes in which the scutcheon does not ascend to the vulva.

Regarding the varieties of scutcheons as characterizing different classes of cows, it is almost impossible, and I think not necessary, to translate Guenon's inappropriate names. The ten classes are represented each by its most perfect specimen in the foregoing wood-cuts. The first class has a scutcheon, the outline of which is shown at figs. 1, 2, 3. Cows thus marked have been termed, by Guenon, *Flandrines*, simply because the breed of cows in Flanders excels all others for its milking qualities, and many of that breed bear a similar mark. I shall confine myself to mentioning the other names of classes, stating the numbers of the figures representing them. *Flandrines a gauche*, figs. 4, 5, 6. *Lisieres*, fig.

7. Courbes Lignes, fig. 8. Bicornes, fig. 9. Double Lisieres, fig. 10. Poitevines, fig. 11. Equerrines, fig. 12. Limousines, fig. 13. Carresines, figs. 14, 15.

In conclusion, I have to repeat that I am inclined to regard the above names and subdivisions into classes as to a great extent superfluous ; but in giving a complete series of cuts indicating the outlines of the principal scutcheons, it has been my object to do full justice to Guenon and his valuable method of determining the milking qualities of cows.

Dr. L. H. Twaddell, a member of the Club, and one of the earliest breeders of Jersey cattle, visited the Channel Islands in 1865, and soon after his return made a report to the Philadelphia Society for Promoting Agriculture, of which the following is an abstract :

“Three thousand Jersey cows and heifers, and about 1200 Guernseys, are exported from the islands every year.

“The Jersey cow is of a medium size. Her peculiar deer-like aspect distinguishes her from the Guernsey. Her head is long and slender, the muzzle fine, and usually encircled with a lighter color ; the nose is black, and the large, dreamy eyes encircled with a black band ; occasionally the nose is of a buff color, when there is a corresponding buff band around the eye ; the horns are usually short, small at the base, tapering, and tipped with black.

“This latter is one of the requirements of the ‘Jersey

scale of points,' and when, as occasionally happens, an animal deviates from the standard, being what is termed 'wild-horned,' the Jerseyman has an appliance consisting of a strong wire clamp, with an arrangement of screws, which he affixes to the horns of the growing beast, and, by dint of filing and screwing up, eventually gives them the orthodox bend.

"The limbs of the Jersey are very slender and fine, her hips broad and developed, her neck is slender and rather long, and the body in the best specimens rotund, and approximating to the short-horn model somewhat, yet with sufficient angularity to ensure milking propensities.

"The abdomen is well developed, giving evidence of sound nutrition; the external abdominal or milk veins convoluted and prominent; the udder broad, running well forward and well up behind; teats squarely placed, rather short than otherwise, and of a fine yellow tint.

"The Jerseys are of all shades of color, from a pale yellow fawn, running through all the intermediate hues, even occasionally to a red, an intermixture of black or gray, known as French gray, and that merging into black with an amber-colored band along the back, the muzzle invariably shaded with a lighter color; and individuals are often seen black and white, or pure black, unrelieved by any other color.

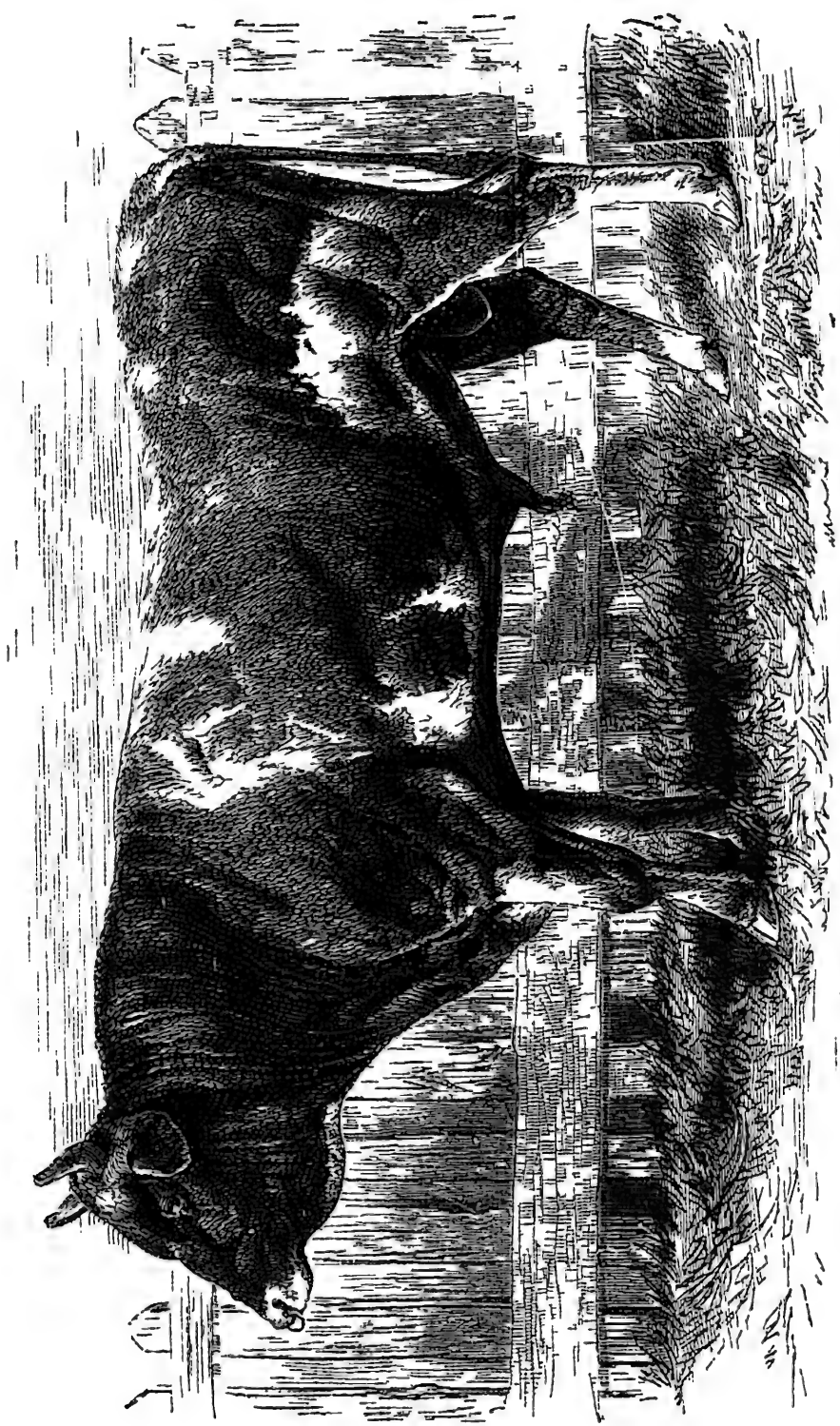
"A yellow brindle is sometimes seen, but this is by no means a favorite.

“The darker colors are the most popular in England, from the belief that they are hardier in constitution and bear the climate better, but this opinion does not accord with our experience in America, where the alternations from heat to cold are much more decided and severe. Here I think I may say with safety that no difference has been observed in constitution or ability to endure our burning summer heats or the cold of our Northern winters.

“The care of cows and dairy devolves entirely on the female members of the family, whilst the farmer attends to his growing crops, or busies himself in the other duties of his little farm.

“The cows are tethered with a rope passing around the base of the horns, with a chain and swivel attached, and are fastened to pegs driven in the ground; they are moved to fresh grass two or three times daily. Should they be pastured in the orchards, an additional rope passes from the halter to each foreleg, and, thus tied down, they are prevented from regaling themselves with the tempting apples which load the low-hanging boughs under which they graze.

“The method of milking cows is somewhat peculiar, the milking and straining the milk being done at one operation; the milkmaid, with her tin pail, linen strainer, and sea-shell, proceeds to the pasture; seating herself beside her cow, she soon completes her arrangements; the linen strainer is securely tied over the narrow-mouthed tin bucket, and, placing the large shallow sea-



JERSEY BULL "JUPITER"

shell on the strainer, with vigorous hands she directs the milky streams into the shell, quickly overflowing the shallow brim, the milk passes through the strainer into the receptacle beneath. This primitive method has been in vogue for more than a century; they claim for it the merit of perfect cleanliness.

“Whilst overlooking the operation, I could understand the use of the strainer clearly enough, but the employment of the shell rather puzzled me, until the milkmaid informed me that it was to prevent the attrition of the streams of milk from wearing a hole in the strainer, this solved the mystery.

“The calves are kept stabled during the first year, and fed on green food during the summer, in the second year they are tethered out.

“The heifers are allowed to have calves at about two years old, and come in profit in April or May, when there is more demand for them in the English market.

“The bulls are kept stabled all the year; in a large number that I saw not one was ringed, and I understood that it was never done in the islands, not one of those I examined was in any way vicious. M Le Gallais (the owner of the prize bull, of Jersey, for 1865), an excellent judge, told me that in his opinion it was due to their being constantly tied up and daily handled.

“The bulls are slaughtered at three years old, the opinion prevails there that the offspring of young bulls have most vigor and stamina.

"In the year 1849, the Royal Jersey Agricultural Society established a scale of points for Jersey cattle as a guide to the judges in awarding the premiums. Thirty-six points established perfection. No prize can be awarded to a cow having less than 29 points, nor can one be awarded to a heifer having less than 26 points. A cow having 27 points, and a heifer 24 points, without a pedigree, are allowed to be branded, but cannot win a prize.

"The term 'pedigree' is employed to signify the offspring of a prize, or decorated male or female. The 'brand' is burned on the horn, and are the letters J. A. S. (Jersey Agricultural Society).

"Besides the Royal Jersey Society, each parish has a stock-breeders' club; the clubs hold their parish shows the month preceding the Royal Jersey; they decorate their prize winners in the same manner by branding with the initial letters of the parish and club, as, for instance, St. Saviour's Club, 'St. S. C.'

"A choice cow is sometimes seen whose horns are literally covered with brands, perhaps winning parish and Royal Jersey prizes two or three years in succession.

"Many breeders will not allow their animals branded on account of the disfigurement it produces.

"The Guernsey is a larger animal, coarser in the head and heavier in bone; the horns are longer and thicker at the base, not usually crumpled; the rump is more apt to assume that peculiar droop which seems a

characteristic of the breed, and there is a want of that symmetry and neatness of form that mark the highly bred Jersey, but as a dairy cow she is fully her equal; for quality of milk and butter she cannot be excelled; the skin is of a splendid rich, yellow hue, and the udder and teats are tinted with chrome.

“The head of the Guernsey is larger, and the muzzle broader, and the eye not so prominent as the Jersey; the nose is usually of a rich yellow or buff; the eye banded with the same color.

“The colors of the Guernsey are fawn, running through the various shades to a deep red, an umber brown, and a peculiar yellow brindle, which is a favorite here.

“Although larger than the Jersey, I do not think they fatten quite as kindly as the latter, which has the advantage of a smoother and more rotund form.

“This thinness and want of condition may be owing in a great degree to the fact that the pasturage is less luxuriant in Guernsey, and also that the Guernseymen are less solicitous about the figure and style of their animals, being satisfied if the animal is a performer at the pail, where she seldom disappoints.

“The cattle of the Island of Alderney (which is the third in size of the Channel group) have a want of uniformity, attributable to the fact that they are the offspring of stock brought from Jersey and Guernsey, crossed and recrossed until all individuality as a breed is lost.

“Some are neat and deer-like; others are larger and heavier, approaching the Guernsey type.

“The island being small and rocky, the pasturage scanty, very few cattle are bred, and, as a consequence, the breed does not receive the care and attention that is given on the other islands.

“It is as a dairy animal that the Channel Islands cow puts forth her claim for consideration.

“Coming into notice after several of the leading British breeds had acquired a world-wide celebrity, her advocates had to contend with the prejudice of English stock-growers and dairymen, who could not be made to believe that anything not English bred could have merit. And forsooth, this stock, French bred, with true John Bull antipathy, they at once decided must be worthless. But latterly this feeling towards their French neighbors has been wonderfully modified, and as the *entente cordiale* is now firmly established, Anglo-Norman cattle, among many other products from across the Channel, have found favor in England. The English dairymen have been induced to try them, and finding they produced more and better butter than the much-vaunted English breeds, have looked at the pound sterling side of the account, and, per consequence, have substituted the despised little Channel Islander for the queenly Short-Horn.”

We will close this chapter by giving the views of one of our best American breeders of the Jerseys, Mr. Charles L. Sharpless, of Philadelphia, on the Mirrors of

Cows. It is a clear, condensed, practical *resume* of Guenon's rules, with valuable additions.

MIRRORS OF COWS.

There is no point in judging a cow so little understood as the mirror or escutcheon. The conclusion of almost every one is, that her mirror is good if there be a broad band of uprunning hair from the udder to the vulva and around it—see fig. 17. These cows with the broad vertical mirror are nearly always parallel cows; that is, with bodies long but not large, and with the under line parallel with the back. Their thighs are thin, and the thigh mirror shows on the inside of the thigh rather than on its rear.

Next comes the wedge-shaped cow, with the body shorter, but very large, deep in the flank, and very capacious. This form does not usually exhibit the broad vertical mirror, running up to the vulva, but with a broader thigh may exhibit a thigh mirror, which is preferable to the other, thus—see fig. 18.

To those not familiar with the meaning of mirror or escutcheon, it may be well to say, that the uprunning hair in the rear of a cow, on and between the thighs, represents the mirror. This uprunning can be easily seen or felt, being in marked contrast with the down-running or body hair; the mirror terminates at the outside of the thigh in a curl or cowlick. In some cases there is another curl, about three inches below the upper one.

In both vertical and thigh mirrors, where the hair runs down, intruding on the udder, as in figs. 19 and 20, it damages the mirror. If you find a cow with the hair

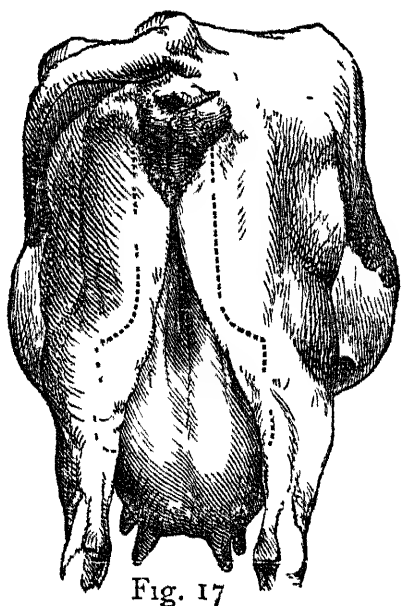


Fig. 17

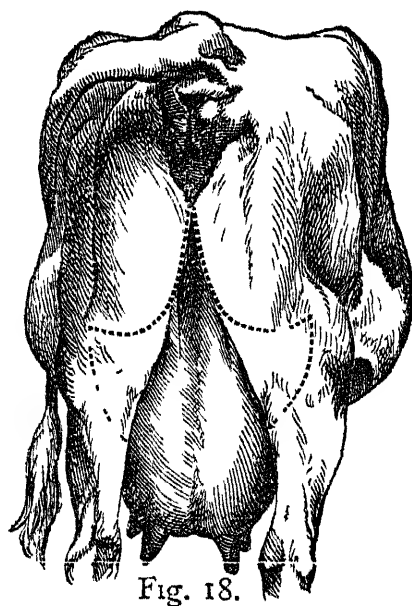


Fig. 18.



Fig. 19



Fig. 20.

all running down and between the thighs—that is, with no uprunning hair—stamp her as a cipher for milk-yielding! The udders to figs. 17, 18, 19 and 20 are made by the artist the same size, while in reality they

will vary according to the mirror. There are times when the udder of a cow mirrored like fig. 20 will be enlarged by non-milking, for the purpose of deception. It is always safer to judge by the mirror rather than by the large size of the udder.

The mirrors of the best cows—those yielding the most and continuing the longest—will be found to be those which conform to fig. 18.

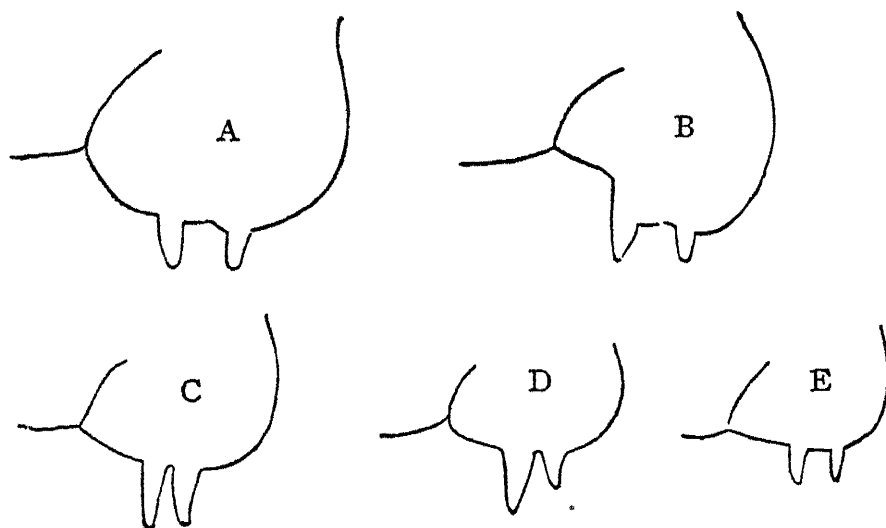
The vertical mirror of fig. 17 would not injure it; but if that ornamental feature has to be at the expense of the thigh mirror, fig. 18 is better as it is.

Whenever a good mirror is accompanied by a curl on each hind quarter of the udder, it indicates a yield of the highest order.

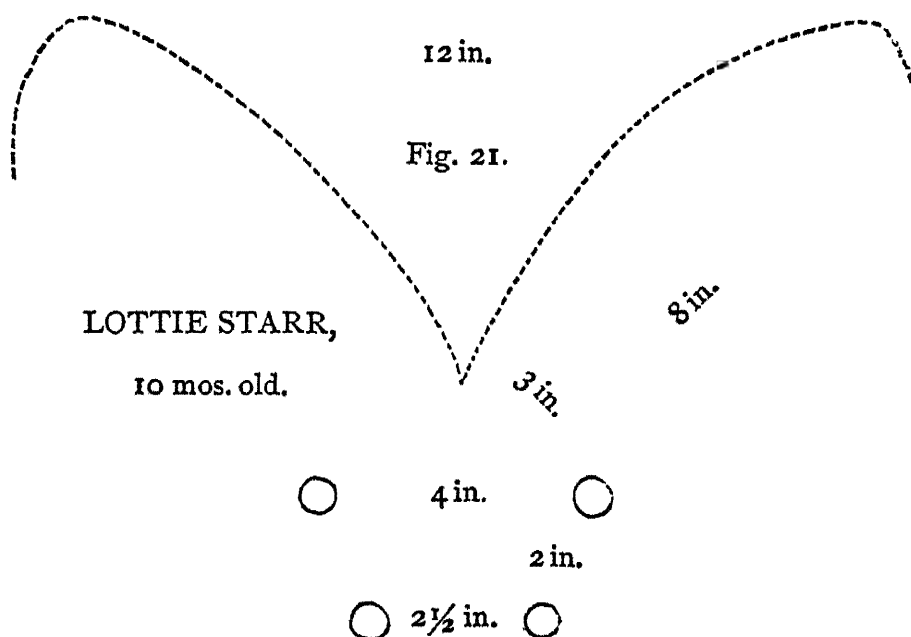
These remarks apply with equal force to heifers and bulls, except that the vertical mirror with bulls never extends so high. In heifers and young bulls the mirror is distinctly seen at any time after one month old, and is precisely the same that it will be when the animal is mature.

So far we have noticed only the rear mirror, or that which represents the two hind-quarters of the udder. The two front-quarters are just as important, and should be capacious, and run well forward under the body (see A). If the udder in front be concave, or cut up, as in B, indicating small capacity, it represents reduced yield. This front or level mirror is distinctly marked in the young heifer or bull, and can be seen by laying the animal on its back. The udder hair under the body

all runs backward, commencing at the forward line of the mirror (see dotted lines in figs. 21, 22 and 23).

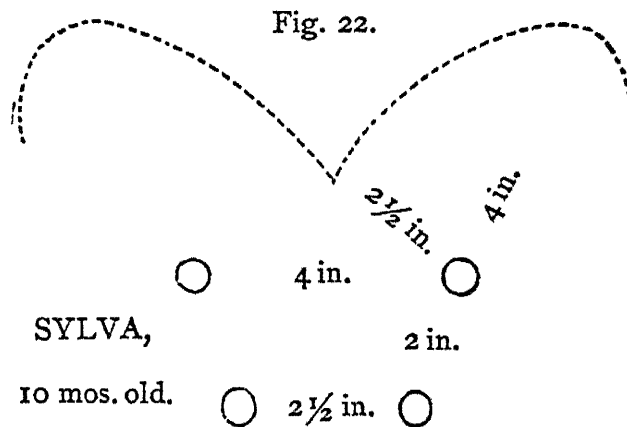


This dividing line is very perceptible, from the fact that the hair in front of it all runs forward towards the head of the animal, while the mirror or udder hair all runs backward over the forward quarters of the udder,

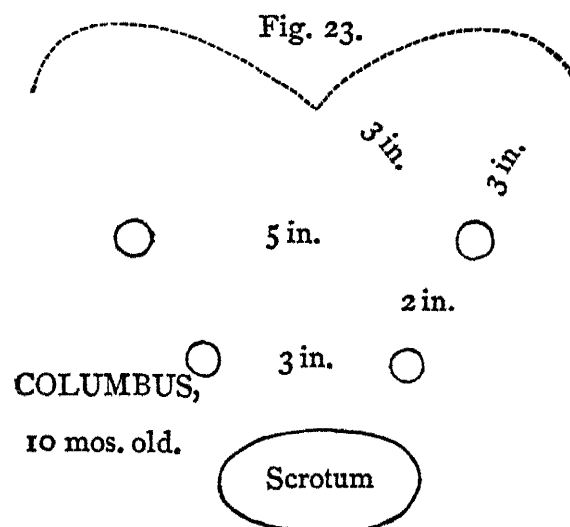


around and beyond the teats, and ceases at the markings of the rear mirror, on and between the thighs.

The breadth and extent forward of this front mirror indicates the capacity, in the mature animal, of the front quarters of her udder. In some cases this front mirror will be found of twice the extent that it is in others, and



is evidence of that much more yield. The dimensions on figs. 21, 22 and 23 are actual measurements—the first two of heifers and the last of a bull. If fig. 22 represents four quarts as the yield per day of the front



quarters, fig. 21 will represent eight. Thus, if the rear yield is the same, say four quarts in each cow, the total yield of fig. 21 will be twelve quarts, while that of fig. 22

is but eight. This examination enables one to see the size of the teats and their distance apart, and to test the looseness and softness of the udder skin. It is marked precisely the same in bulls (see fig. 23), and can be easily examined at any age between one and ten months.

Udders of all shapes hold milk, and some homely ones hold a large quantity. B, C, D and E, at a glance, explain their deficiencies, both of shape, lack of capacity and bad style of teats. In udder A we have the perfect shape.

Besides the front extension of the udder in the cow, the vein called milk-vein, running forward on the under-side of the body, should be large and irregular, and if forked at the forward end, with two holes of exit from the body, so much the more evidence of the large milker. If there be three holes of exit, it means the largest yield.

Many think that the mirror of the bull is of but little moment, so that he is a good-looker. So far is this from being the case, that a bull with a mirror like fig. 20 or worse will stamp his mirrors on and to that extent damage his daughters, out of cows with mirrors as choice as fig. 18. In this way, the daughters of some of the best cows come very ordinary, while, if you use a bull marked like fig. 18, he will make poor mirrors better, and will improve the best. His injury or benefit will be doubled according to the mirror markings under his body in front of his scrotum. Hence the import-

ance of the dam of a bull being unexceptionable in her udder and mirror. Her qualities inherited by her son will be transmitted to her daughters.

While careful as to mirrors we must not neglect the other essential features of a good cow, the buckskin hide, the rich-colored skin, and the fine bone. Let the hair be soft and thickly set, and let the skin be mellow. This latter quality is easily determined by grasping between the thumb and forefinger the skin at the rear of the ribs, or the double thickness at the base of the flank that joins the stifle joint to the body, or that on the inside of the rump bone at the setting-on of the tail. Let the teats be well apart; let them yield a full and free stream, and be large enough to fill the hand without the necessity in milking of pulling them between the thumb and forefingers. And let us ever keep in mind that the large yielder must be well fed. In this connection, though foreign to our subject, it seems a fit time to speak of field arrangements for milking. In our own fields we have sheds for shelter, and in one of them, which is in a central position, cheap stanchions are arranged so that each cow at milking time is fed a quart or more, according to yield, of good bran. Some object to this, on the score of economy, and others are loth to acknowledge their cows having anything but grass. This is the first season we have ever fed while the cows are on grass, and their condition and yield has convinced us of the wisdom of the practice. It helps to sustain the system of a large yielder, drained by the

flow of milk, and needing extra sustenance for the growth of the unborn calf. It saves all necessity for driving the cows; it keeps them quiet while being milked; it saves the time and temper of the milkers. So well do they know it, that a call will bring them at feeding time from any distance. In the stanchions they quietly remain until milked, thus saving the trouble and annoyance of milking in flytime an unfastened cow.

SCALE OF POINTS.

(As adopted by the Royal Jersey Agricultural and Horticultural Society.)

Article.	BULLS.	Points.
1.	Head, fine and tapering.....	I
2.	Forehead, broad	I
3.	Cheek, small	I
4.	Throat, clean.....	I
5.	Muzzle, fine and encircled by a light color.....	I
6.	Nostrils, high and open.....	I
7.	Horns, smooth, crumpled, not too thick at the base, and tapering, tipped with black	I
8.	Ears, small and thin.....	I
9.	Ears, of a deep orange color within.....	I
10.	Eyes, full and lively.....	I
11.	Neck, arched, powerful, but not too coarse and heavy.....	I
12.	Chest, broad and deep.....	I
13.	Barrel-hooped, broad and deep.....	I
14.	Well-ribbed home, having but little space between the last rib and the hip	I
15.	Back, straight from the withers to the top of the hip.....	I
16.	Back, straight from the top of the hip to the setting-on of the tail; and the tail at right angles with the back.....	I
17.	Tail, fine.....	I
18.	Tail, hanging down to the hocks.....	I
19.	Hide, mellow and movable, but not too loose.....	I
20.	Hide, covered with fine, soft hair.....	I
21.	Hide, of good color.....	I
22.	Fore-legs, short and straight.....	I

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Article.	Points
23. Fore-arm, large and powerful, swelling, and full above the knee, and below it.....	1
24. Hind-quarters, from the hock to the point of the rump, long and well filled up	1
25. Hind-legs, short and straight (below the hocks), and bones rather fine....	1
26. Hind-legs, squarely placed, and not too near together when viewed from behind.....	1
27. Hind-legs, not to cross in walking	1
28. Hoofs, small	1
29. Growth	1
30. General appearance	1
31. Condition	1
Perfection	31

No prize shall be awarded to bulls having less than 25 points.

Bulls having obtained 23 points shall be allowed to be branded, but cannot take a prize.

COWS AND HEIFERS.

Article.	Points.
1. Head, small, fine and tapering	1
2. Cheek, small.....	1
3. Throat, clean... ..	1
4. Muzzle, fine and encircled by a light color.....	1
5. Nostrils, high and open.....	1
6. Horns, smooth, crumpled, not too thick at the base, and tapering.....	1
7. Ears, small and thin.....	1
8. Ears, of a deep orange color within.....	1
9. Eye, full and placid.....	1
10. Neck, straight, fine, and placed lightly on the shoulders	1
11. Chest, broad and deep.....	1
12. Barrel-hooped, broad and deep.....	1
13. Well-ribbed home, having but little space between the last rib and the hip	1
14. Back, straight from the withers to the top of the hip.....	1
15. Back, straight from the top of the hip to the setting-on of the tail; and the tail at right angles with the back.....	1
16 Tail, fine.....	1
17. Tail, hanging down to the hocks.....	1
18. Hide, thin and movable, but not too loose.....	1
19. Hide, covered with fine, soft hair.....	1
20. Hide, of good color.....	1
21. Fore-legs, short, straight and fine.....	1
22. Fore-arm, swelling and full above the knee	1
23. Hind-quarters, from the hock to the point of the rump, long and well filled up.....	1
24. Hind-legs, short and straight (below the hocks), and bones rather fine...	1

Article.	Points
25. Hind-legs, squarely placed, not too close together when viewed from behind.....	1
26. Hind-legs, not too close in walking.....	1
27. Hoofs, small.....	1
28. Udder, full in form, <i>i. e.</i> , well in line with the belly.....	1
29. Udder, well up behind....	1
30. Teats, large and squarely placed, behind wide apart.....	1
31. Milk-veins, very prominent	1
32. Growth.....	1
33. General appearance.....	1
34. Condition	1
Perfection	34

No prize shall be awarded to cows having less than 29 points.

No prize shall be awarded to heifers having less than 26 points.

Cows having obtained 27 points, and heifers 24 points, shall be allowed to be banded, but cannot take a prize.

Three points, viz., Nos. 28, 29 and 31, shall be deducted from the number required for perfection in heifers, as their udder and milk-veins cannot be fully developed; *a heifer will therefore be considered perfect at 31 points.*

The scale of the Jersey Society is constructed on the basis of giving one mark to each of 31 points on bulls and heifers, and 34 points on cows, so that each point, if sufficiently perfect, receives its mark, and if not is dropped altogether. In the scale of points adopted by the New York State Agricultural Society, the Jersey scale is taken almost verbatim, but *ten* is the mark of perfection on each point, and lower numbers are used as each is thought to approach the proper standard. Then there is added ten for pedigree on sire's side, and ten for pedigree on dam's side, in order that the character of the animal's descent may count toward the final result. This makes the aggregate of perfection 330 on bulls and 360 on cows, instead of 31 and 34, as in the Jersey scale.

The intelligent and impartial use of this scale cannot fail to raise the standard of our exhibition cattle, by requiring them to be well formed in every essential part in order to obtain the highest prizes. Defects of form are often covered up by superfluous flesh, whereby the unskilled eye is imposed upon, and the estimate of the crowd is rendered incorrect. It is the duty of judges to probe this excess of fat, and find the true points of the animal, and breeders will be obliged to conform. American Jerseys will be kept pure in their characteristics, and not be perverted into poor imitations of Durhams.

The Jersey scale was formed before the promulgation of the remarkable theory of Guenon respecting the milk-mirror or escutcheon as a visible sign of dairy qualities. But this method of judging of dairy stock is now so favorably received by intelligent breeders, that it should be taken into consideration by the judges awarding premiums at our agricultural fairs. If a breeder, in purchasing an animal for the dairy, looks for this sign of quality, why should he not recognize it in making up his judgment of animals exhibited for premiums? Experience proves that a perfect escutcheon can be perpetuated from generation to generation as certainly as can any other outward marks of milking capacity. If a cow or bull has a defective escutcheon, according to the rules of Guenon and as developed by Mr. Sharpless, how can the first prize for breeding or dairying qualities be consistently awarded, even if all the other points are good?

CHAPTER III.

THE ART OF FEEDING.

It must be apparent to every thinking person that all the before-mentioned qualities, even in the highest perfection, will not ensure an abundant and rich supply of milk unless proper care is taken to furnish the cow with the kind of food best calculated to the required purpose. How often is it found that complaint is made by one person that such a cow is a bad milker, when the same animal, transferred to other hands, has given every satisfaction! This is easily explained by the fact that in the first case the cow has been kept on foul pasture or on improper food. It becomes, therefore, peculiarly necessary to set forth the manner of feeding which experience has proved to be the most advantageous for the production of rich and sweet milk.

The first requisite in feeding is, that the animal should have abundance of food, so as to be able to consume all that she requires in as short a time as possible, as then she will lie down and have the more time to secrete her milk, and that milk to acquire richness. The pasture should be often changed, and if not in pasture the food should be succulent, otherwise fat instead of milk will be produced; but cows fed with food of too watery

a nature, which is the case with roots early in the season, require an addition of more solid food, such as meal or good clover chaff, otherwise the milk, although considerable in quantity, will be poor and wheyey, yielding no cream. Such roots should be carefully selected as have no symptoms of decay or rottenness, and should be mild in flavor or the butter will be tainted. In very cold weather, and as a change of food, use *crushed* linseed and *bruised* oats, steamed or boiled.

Mangel-wurzel, which has become, from its luscious qualities, so favorite a food for the dairy cow, requires much care and judgment in its use, and should never be given before the month of January, as the longer it is kept the less acidity is produced by it; and even then, in my opinion, should always be accompanied by from four to six pounds of barley meal or corn meal to every bushel, to correct the irritation occasioned by its sole use, many dairies of good cows having, within my own knowledge, been weakened so as to cause disease and barrenness for want of the adoption of this principle. The best—and, in fact, the only roots that should be given—are carrots, the yellow bullock turnip and mangel, succeeding each other from the time they are required till the cow returns to pasture. Grains and mangel-wurzel are only to be used when a large quantity of milk, in which quality is not sought, is desired. Many cowkeepers in London feed with these for that purpose, and are, in consequence, though selling a genuine article, wrongly accused of diluting the milk.

It must be obvious, therefore, that such food is useless for the purpose of producing cream and butter. I consider grains utterly inadmissible for the dairy cow, and mangel only to be used in the manner before stated as a change of diet.

The cow and the horse can well pasture together, but no other animal should be allowed to run in the same field, pigs and poultry spoiling and tainting the feed. All rank weeds must be carefully eradicated, and garden refuse kept out of the cow's reach, especially shrubs, yew-hedge cuttings, etc., these things being often poisonous, and occasioning the cow to slip her calf. The same remark will apply to dead and putrid matter.

Let the pasture be free from ponds or other dirty drinking-places, where the water is fouled and rendered unwholesome by decayed matter or the drainage from dung-heaps, and by the habit which cattle have of standing and manuring in it for hours together. A clean tub or tank should be used for watering the cattle, and kept supplied with pure, sweet water, which, if pumped from a well, should be exposed to the air a considerable time before use.

Cows should be taken in about sunset, or before they are preparing to rest for the night, and on no account allow them to be hurried to or from pasture, especially when full of milk.

Cows should always in winter be well fed, regularly fed, and sufficient food of the right kind. Twice a day

as much as they will eat of good timothy and clover hay mixed, with two quarts of Indian meal unbolted, four quarts of wheat bran, and half a peck or a peck of carrots or sugar-beets to each. Turnips may be fed to dry cows, but to milking cows they give a taste to the milk and butter. Corn-fodder is excellent food as an addition, but if fed by itself will give an unpleasant taste to both milk and butter. Steamed or cooked food is now much used and to great advantage; cows will eagerly drink the hay-tea that is left after steaming the hay. Potatoes, raw or cooked, are excellent food, and thus the small ones come into play. In summer-time, or early fall, if the pasture is short, fresh corn-fodder helps the milking qualities wonderfully. This should always be grown, as large quantities can be raised in a small space, though rather difficult to cure for winter use.

Eight tons of green fodder, or four tons of dry fodder, is about a fair medium crop to an acre of sweet corn, planted close, and sufficient to last one cow a year, feeding about forty-five pounds green or twenty to twenty-five of dried fodder per day. A larger amount will be raised from Chester county corn, and planted in drills, the seed dropped in every third furrow. Corn-fodder is the great standard crop for soiling, and should be sown and fed as early as possible in the season, as the earlier in the season it is fed the more it will help the milking qualities.

For curing and storing the fodder, the best way is to

allow it to wilt a few days after cutting, then place it in the barn, with alternate layers of dry straw, each layer about eight inches thick. The straw absorbs the juice from the stalks and prevents heating and moulding, success depending upon the previous amount of drying. Being sown at the rate of some three bushels per acre, it forms no ears, and consequently there is but little exhaustion of the richness of the stalks or of the fertility of the land, more being left in the soil by the roots than is carried off in the stalk and leaf; besides, the shading of the ground prevents the growth of weeds. Another advantage is the readiness with which the crop may be sown on any waste piece of ground that may be plowed later than it would do to plant a common crop.

The following is the management of an intelligent young farmer whose herd of cows, fed for milk, produced an average of over 2300 quarts. The winter feed was principally an allowance of three bushels of cut feed and ten quarts of corn-meal and wheat bran mixed in the ratio of one to three. This was fed in three rations, and immediately after one feeding was done another was mixed up, thoroughly scalded, and let stand, closely covered, until next feeding time. These feeds were occasionally interspersed with one of roots. In summer the cows run at pasture in the day, are stabled at night in an open, airy shed and fed a heavy ration of either green rye, oats in milk, Hungarian grass, or cornstalks just coming into tassel, according as one or the other was fit. Before they were

turned out in the morning they had a similar feed. He purposes to vary this feed more by giving one week cotton-seed meal instead of corn-meal, another week linseed-meal, etc., also a larger supply of roots, the cows needing variety as well as quantity.

We also can recommend the following for winter feeding: In the morning, after the cows are curried and cared for, cut up one peck of carrots for each cow; after eating, the cows are milked, and while milking is going on, the water is put on to boil in the boiler. In a large trough is put three-quarters of a bushel of cut hay for each cow, and the boiling water poured on. Five quarts of shorts and two quarts of Indian meal are added. This is well stirred, and fed warm, not hot, with another feed of cut carrots at night and plenty of good hay during the day.

CHAPTER IV.

THE MANAGEMENT OF THE COW.

THE proper *management* of milking cows is no less necessary than proper *food*.

It should be always borne in mind that the animal whose capabilities are for milking becomes lean on the same quantity of food as will make the feeding cattle fat. The consequence of this is that the milking and therefore lean cow is more affected by changes of temperature than the feeding or fat one.

It follows that in the successful management of the milch cow great care should be taken to avoid rapid and considerable changes of temperature, as well as damp or strong clay land. There should always be a clean, dry shed in which the cattle may take shelter whenever they feel uncomfortable either from heat and flies or from cold and damp. This shed should be so constructed that it may to a certain extent clean itself by drainage, to avoid the accumulation of foul water, the floor being constructed of materials of a dry nature. The aspect should be such as to avoid north and north-easterly winds.

An animal always cold is always uncomfortable, and a large proportion of the food she takes is consumed in

keeping up the heat of the body, instead of making milk; warmth is therefore, in effect, food to the cow, and may be obtained at little cost and with little trouble by means of a shed as recommended: and where this is dry and clean, the cow will resort to it spontaneously whenever she knows it to be conducive to her warmth which, as above said, is her food to a great extent. Cold and sudden chills, on the other hand, are a great detriment to the appearance of the cow, and are frequently the cause of her falling off in her milk so early in the season.

So important is it to provide against great alteration of temperature that the impossibility of doing this in large pastures has within the last few years engendered the lung disease which has been so destructive among cattle. Formerly, pastures were small in extent and defended by large and thick hedge-rows as well as trees, but the practice latterly having been to open the fields and to divest them of everything which could form a shelter for the cattle, what has been gained in increasing the quantity of feed has been lost by the disease which the inclemency of an unsheltered field has engendered. It is much to be questioned whether Nature was not the best judge, after all.

Much injury is likewise done by turning cattle out too early in the season, exchanging them from a warm yard or shed (especially just after calving) to pass the night in the open air before the season is sufficiently advanced to make such exposure bearable.

In proportion as the breed of cattle has improved, so has the necessity of care become apparent, delicacy of constitution and physical sensitiveness always increasing with high blood. As a principle of economy I strongly advocate the practice (which is lately gaining ground) of bringing milch cows in at night *all through the year*, for they spoil much grass, especially in full, strong pasture, during the night, and are not benefited by being in the dewy grass too early in the morning; the manure also would be in the yard, where it is valuable, instead of under the hedge, where it is lost, and where the cattle would naturally lie for protection.

During the winter, when tied up in stalls, great advantage is derived from thoroughly cleaning the cattle occasionally with a brush, as they cannot then turn round and lick themselves or rub as they would in the field. A currying is as good as a feed.

The feet should also be examined, lest they should get too long and thereby weaken the pasterns, which is easily remedied by the removal of a portion of the toe with a small saw.

M. Le Cornu gives the following as the management pursued in Jersey:

“In order to derive the greatest possible advantage from his cows, the Jersey farmer endeavors to arrange or them to calve during the first three months of the year; that is, when vegetation speedily advances. In the winter, cattle are always housed at night: when they come in (about four o'clock in the afternoon), they

are milked, after which each receives about three-fourths of a bushel of roots and a little hay; they are then left until eight o'clock, when a bundle of straw is given to each one. The following morning they are attended to at six o'clock, or even before that hour; having been milked, they again receive the same allowance of roots and hay as before mentioned, and at nine o'clock are turned out, if fine, in some sheltered field or orchard; then the stables are cleaned out, and the bedding renewed if required. Cows are dried one month or six weeks before calving; bran mashes are given to them about the time of parturition, and continued for a fortnight after the calf is born: at no other time do they receive this food. Bull calves intended for the butcher receive the cow's milk for about a month or six weeks, then they are considered fit for sale. A good calf will sell for about fifty shillings, some for more, but many for less. If the calf be a heifer, she is always reared and kept in the island until she is two years old; when, if not required, she is sold for exportation. Returning to the cow: two weeks or so after calving, if the weather be very fine, she is turned out to grass in the day-time: it is the custom in all the Channel Islands to tether cattle; the tethers are made of small chain; a spike about one foot long is attached at one end and driven into the ground; the other end is tied to the cow's halter, the latter being made fast at the base of her horns; the length of these tethers is altogether about four yards. During the day, cattle are frequently

moved, generally every three hours, and sometimes oftener; drink is given to them in the morning on leaving the stable, and at noon; if it be summer-time, they receive it also in the evening. About the month of May they are allowed to remain out at night, and continue so until the end of October, when the system of housing above described recommences. During summer, cows are frequently milked three times a day; and when the weather becomes very warm, they are brought into the stable for a few hours, else they would be tormented by flies. At this period (height of summer) a great diminution takes place in their milk; but as the heat ceases toward the fall, it rapidly springs up again to what it was in the spring: this is the time when butter is crocked for winter supply. A cow is in her prime at six years of age, and continues good until ten years old; many are kept that are much older, but then they begin to fall off. In general, cows have their first calf when much too young; at two years old is their usual time, but then their produce is small, and continues so for at least a twelvemonth, when it gradually increases until it arrives at maturity. A good cow on the average gives fourteen quarts of milk per day, or eight or nine pounds of butter per week: instances are common of cows giving twelve or even fourteen pounds of butter in one week, but that is above the average figure."

Perfect cleanliness in every part of the cow-house is of essential importance—to judge from the filthy con-

dition in which many—too many—are kept, we would think that this was not essential. The stalls should be kept clean, and not only so, but the walls free from cobwebs and dust; and not less essential is it that the mangers should be kept clean also. If we would only pay a little attention to the habits of our farm animals, it would be seen that they are scrupulously clean, almost fastidiously so. Much of the benefit of good food is lost by giving it badly prepared and in dirty mangers or boxes. The importance of ventilation will be to a large extent lost if the interior of the house is not kept clean. It is of little use to admit fresh air to the interior if it is only there to be mixed with noxious emanations arising from the presence of dirt. Another point to be attended to is the bedding or littering for the cows; in many cases this is grossly neglected, the animals being kept in a very uncomfortable condition. As a rule, the long straw which is generally used is used in a way anything but economical; by far the most efficient and most economical way to use straw is to cut it with the straw-cutter. This may appear to be a costly mode of using it, but it is quite the reverse. Less straw is required in this form than if used long, and it not only admits of the “droppings” of the cow being lifted easily away without disturbing the rest of the bedding, but it is, when done well, in the best condition for the manure or dung heap. Sawdust also forms an excellent bedding, as do chaff, leaves, and fine tanner’s bark. The ammonia which, in even or-

dinary circumstances, rises from the droppings and bedding saturated with urine, and is lost, may be fixed by sprinkling the bedding and the gutters with sulphuric acid, the oil of vitriol of commerce; 1 lb. weight of this will fix the ammonia of 60 or 70 gallons of urine. The liquid should be led at once from the house to the liquid manure tank, which will soon pay for itself; the using of sulphuric acid will raise the value of the liquid manure, that being estimated at ten dollars a year per cow. The cost of the acid thus used will be very trifling: an authority puts it at two cents per cow per week.

The best material for making floors of cow-houses is "Portland Cement Concrete;" it is easily made, easily laid, economical and gives a surface as fine and as hard as stone. Grooves for giving a foot-hold, if thought necessary, and gutters can be formed in it with the greatest ease. A level floor is decidedly objectionable; no amount of litter will keep cows clean on such a floor. A plank floor should be laid in the following form: A space 5 feet wide should be left for the cow to stand on from the manure drop to the manger. The manure drop should be 12 inches wide, 7 inches deep and water-tight. If planks are used for the floor, hewed or sawed timber may be laid down to form the sides of the drop; the bottom should be pounded stone grouted in cement. The five foot stand for the cows should have an inclination of 3 inches toward the drop.

A plank floor is very objectionable because—1st. It

is not durable; 2d. It absorbs the urine and corrupts the atmosphere of the stable; and 3d. Because it is always slippery when wet, frequently causing serious accidents to stock.

The best floor in cow stables is hard brick set on their edges; after the brick are properly laid mix one part of cement with two parts of sand, adding a sufficient quantity of water to make the material so it could be readily poured out of a pail; this mixture should be poured on the brick and brushed over with an old broom; the brick will thoroughly join together by the cement, making a water-tight floor on which cattle never slip, and one which will last a long time. The manure drop is made by excavating the earth and laying the brick in cement. The drop is 12 inches wide by 7 inches deep, and is perfectly water-tight. A discharge-pipe may be connected with the drop, leading to a compost-heap, or a little dry earth may be daily thrown in the drop, which will readily absorb all the liquid manure. But not only should the house be kept clean, but it is essential that the animals themselves be so also. It is unnecessary here to describe in detail the influence which the skin has upon the health of an animal; suffice it to say that it performs most important functions which cannot be performed if the coat of the cow is kept in a filthy condition, filled with dust or coated over with patches of hardened manure; this condition of body induces the attacks and aggravates the evil effects of lice, etc. All sorts of cures are advocated for this

plague of parasites with which cows are afflicted, but if they were kept perfectly clean, there would be fewer occasions when such cures would be necessary. Prevention is better than cure, and by attending to the cleanliness of the cow much would be prevented. Cows should be curry-combed, or at all events rubbed down carefully several times a day with a wisp of straw, and all manure removed from their coats. All this may be considered troublesome, as no doubt it is; but then anything worth doing is not done without trouble, and to make cows pay cannot surely be called an unnecessary trouble.

CHAPTER V.

THE ART OF MILKING.

As a general principle, cows should be milked twice a day, and the times of milking should be invariable all the year round—viz., at six in the morning and six in the evening. If after calving, in the early state of milk, it should be found that the bag becomes too full from extreme heat or other cause, it will be advisable to reduce the bag in the middle of the day, in which case eight o'clock in the evening will be early enough for the last milking; but some judgment is requisite in putting this into practice, as too great eagerness to relieve the bag may have an injurious effect, by weakening its power of retention. Before and during the time of milking the cow should have some good hay, chaff or meal. This is beneficial in two ways—first, it is a wholesome stay to the stomach, and secondly, it engrosses the attention of the animal and quiets it during the operation.

The hands should be dry and clean; wet hands chafe the teats in cold weather, and want of cleanliness produces warts. Take great care that the last of the milk is withdrawn, as one pint of this is richer for the production of butter than two quarts of milk first drawn

off. This point is of paramount importance, as, independently of the quality thus produced, imperfect milking will dry the cow much earlier than if properly milked, and tend to decrease the quantity. Milk as quickly as possible, and never leave the cow during the operation: an active milker may milk five cows an hour; therefore, with a dairy of ten or twelve cows, two persons should be employed, and so in proportion, or regularity will be interfered with. Six weeks prior to the time of calving commence to dry the cow by milking once a day for three or four days, which will decrease the quality; then cease milking for three days, taking care that the bag does not get over-filled by the cessation (which must be very carefully observed in hot weather); after this the judgment must be exercised as to any future milkings, which, if possible, should cease altogether one month before calving. In all cases thoroughly cleanse the bag, as, should any milk be left, disease may be originated by the remaining secretion, which will be very injurious at the next time of calving. A few days prior to calving, should the bag be found much distended, it should be thoroughly relieved. This system I have pursued for many years, having a hundred calves annually without the loss of a single cow.

Whatever may be the cause of restlessness or irritability of the cow during milking, gentleness is the only treatment that should be allowed—violence or even harshness, never. There are many causes after recent

calving that may produce inquietude, but no other remedy will be effectual. A young animal never forgets ill-treatment, and a recurrence of similar circumstances will remind the cow of former punishment.

All owners of cows should thoroughly understand the principles of, and be able to perform the operation of milking as it should be done. Very many persons, children and grown persons, set about and are trusted with the business of milking who never perform their part properly, although they may have practiced for years.

Almost all cows in milk are nervous animals, if not often wilful, and in order that you may obtain all the milk they are capable of giving, they must be treated with the utmost gentleness, and that at all times. If a cow stands in fear, perhaps trembling, of your blows, kicks or threats, she will very likely withhold her milk; at all events, it will affect either the quality or quantity to a greater or less extent. There are seldom cases requiring chastisement; more frequently kindness, with firmness, will answer a much better purpose. In most cases where chastisement is administered, an expectation of a full quantity of milk will be disappointed.

The cow should be first brought to a proper position by approaching her on the right side, stool and pail ready; place the stool, sit down on it, and with the right hand brush the bag and teats clean before commencing to draw the milk. During this operation the milk flows in rapidly, and all the ducts leading to the teats are

filled completely. The faster and sooner it is completely drawn out, with gentleness, the more likely you will be to get the whole. The milker who sits and talks, or in any way delays his business, will never obtain all the milk the cow is capable of yielding.

The stripping, to obtain the last drop, should be done with great gentleness by working the udder somewhat in imitation of a calf sucking. A person who understands and faithfully performs the operation of milking will cause the cow to yield milk that will make one-quarter more butter than one-half the common grown persons who do the milking will. This is a strong assertion, but no stronger than we believe the facts will warrant.

All beginners should be properly taught at first how to take hold of the teats; and when once learned, they will remember. This is seldom explained or taught to beginners, and hence each chooses his own mode of milking. They should be instructed that if they would milk with ease, the hand should be kept very near the extremity of the teats—not so near, however, as that the milk will strike any part of the hand or fingers. They should sit down close to the cow, not at arm's length away; the left arm should always press against or be in close proximity to the leg of the cow, and then if she kicks or steps, you can ward off the force and protect yourself and pail of milk.

With proper handling of heifers while young and previous to calving, there is very little liability to have

kicking cows. Sometimes a heifer with her first calf, and even older cows, get their teats sore, cracked or otherwise, and this will cause uneasiness, and often pain them so as to cause them to kick or step. In all such cases they should be humored, coaxed and dealt gently by, and even caressed and fed some choice bite after milking. It would be well to have a pot of soft grease from the top of the pot where pork and greens have been boiled to apply to soften the cracks, etc., previous to milking, and again afterward. The above-mentioned grease is the best application the writer ever used to soften and heal cracked and sore teats on cows.

For milking cows that kick we give a few receipts. Though this ugly habit may, and sometimes does, arise from viciousness, we believe in most cases it arises from some tenderness in the udder from soreness, or swelling, or cracked teats, or other cause.

Take a simple holdback strap from a set of harness—or to have a new one made purposely would be better—slip the noose over the cow's off foot and buckle the near one to it, and thus the worst kicker can be milked. If there are two or three cows that kick, the same strap will answer for all. The cows can occupy whichever stalls are most convenient in the barn; or if milked in the cow lot in summer, fasten a cow chain to one of the fence posts, chain and strap and milk your kickers in succession without any fear of a broken nose.

Halter the cow, then have a small rope long enough to reach around her body, on one end of which have

a hook which is put over the cow in front of the hip-joints and in front of the udder, and hooked over the rope, which is then drawn moderately tight and tied with a tuck knot. The cow soon finds she is powerless for mischief, and with a few times' milking thus secured, she yields to kindness and gentle, soothing treatment.

Prepare a strap the right length; take the leg next to you when milking, bend it, pass the strap around the leg, let the cow stand on three legs, and one can milk with perfect safety.

Tie up the heifer, her head as high as possible, and tie her legs with a common rope.

When cows withhold their milk, they are commonly in a dissatisfied state of mind, and therefore anything to draw their attention from this condition answers a good purpose. We have always succeeded by giving them a mess of food to amuse them while the milking is going on, generally dry meal, so as to keep them long occupied. If they have suckling calves, let them suck at the time of milking. Driving them in a position so that their fore legs will stand on much higher ground than the hind legs, or on lower ground, counteracts the animal's attention, and generally succeeds. It is said that a weight on the small of the animal's back, as a bag of grain, will answer, but we know nothing of its efficacy.

CHAPTER VI.

THE DAIRY, AND ITS MANAGEMENT.

THE dairy-house should be built on slightly-elevated ground and on a dry spot, sheltered as much as possible from the south, north and east; it should be sunk at least a foot in the earth, for the sake of coolness.

The floor should be of bricks or tiles, on a descent toward the drain, which should have a plug, so that spring water may be retained on the floor for three or four hours during the day in the heat of summer. The plugging the drain when its use is not required will also have the effect of preventing any effluvium rising through it, which might originate at its outlet from decayed vegetable or other matter.

The benches, which should be kept a few inches from the wall to allow of free ventilation and to prevent insects from falling into the pans, may be of stone or slate, the latter material being preferable.

The windows, which should be so placed as to allow of a free current of air passing through the building, should be of perforated zinc, with shutters to close in the winter; and exteriorly to every window where the sun can fall at any time of the day there should be placed a kind of Venetian blind, to keep the rays from falling through the zinc.

Never allow the dairy to be used for any other purpose than that for which it was originally intended: nothing but milk, cream and butter should at any time be permitted to be placed there. To use it as a pantry or to keep beer in is to ensure tainted butter. The rays of the sun should be carefully kept from falling on any part of the cream, either in process of formation or when skimmed off ready for churning.

The dairy utensils consist of the churn, sized according to the number of cattle and frequency of churning; pans for holding the milk, containing from eight to ten quarts, and as shallow as possible, a deep pan to hold the cream during accumulation; neat butter-prints, of white wood; ivory butter-slice; fine linen cloths, to cover the butter; a marble slab, to deposit the butter on; a small ladder, to lie across the milking-pans to support the strainer; the strainer itself, consisting of a sieve-hoop, about seven inches deep, with a band to fit over it to keep the straining-cloth closely on; milking-cans, of strong block tin, as being more easily kept sweet than wooden buckets; and good flat wicker baskets to carry the butter.

The milk-pans I recommend to be made of glass, which is a non-conductor of lightning, and can be kept sweet and clean by merely wiping with wash-leather, while scalding will scarcely be sufficient for a porous material. The cream-pan should also be of glass.

THE MOST SCRUPULOUS CLEANLINESS, IN EVERY PARTICULAR, IS ABSOLUTELY INDISPENSABLE.

As soon as ever the milk is taken from the cow have it in, and strain it carefully through the sieve into the pans before it gets cool; after which it should not be disturbed till skimmed, and care should be taken not to agitate the milk before it is deposited in the pans to set; all milk required for use must therefore be taken before putting in the pans.

As an equable temperature is advantageous to the speedy production of the cream, in hot weather the floor of the dairy should be kept moist, to produce coolness by evaporation; and in winter a small stove will be of benefit, if smoke and smell be avoided in its use.

To produce the most delicate butter, where economy is not an object, the first rising of the cream (about twelve hours after the milk has been panned) should be taken, but for ordinary purposes the milk should stand twenty-four hours in summer and forty-eight in winter. The cream while accumulating should be stirred night and morning, which will air it and keep it sweet to churn once or twice a week—that is, once a week in the cold and cool months, and twice during the warm months, June, July, August and September.

Be careful to keep all tin vessels well-tinned, so that no rust of iron shall come in contact with the milk, and look well to the earrings of the pail-handles, that grease and dirt may not accumulate there. Be sure also that your strainer and all other cloths are kept well scalded and cleansed: in fact, too much stress cannot be laid on the word CLEANLINESS.

The process of churning will be much promoted in winter by warming the churn with hot water previously to putting the cream in; and in summer, cold spring water put in the churn with the cream will make your butter firmer. The churn should not be above two-thirds filled for churning.

The production of milk for butter-making is essentially the same as that for cheese-making. There is this difference to be observed, however: For cheese we must look principally to the quantity of caseine in the milk, for butter we must consider the yield of cream entirely. Cows must be selected accordingly. For both purposes the same care as to cleanliness, quality of feed, purity of water and gentle treatment of the cows should be observed. The milk in both cases needs to be aired and cooled soon after milking.

From this point quite different handling is required. For cheese we constantly agitate the milk to keep the cream from rising; for butter we must set the milk to rest as soon as possible, and not only avoid all stirring, but not allow it to be even jarred. The more perfect the rest the more completely the cream will rise.

It is still a subject of debate as to whether the cream rises better in shallow or deep dishes. But it is certain that it will rise in either kind of vessel if all the other conditions are right. The tendency is toward setting milk in deep pails and in large masses. Recent experiments, however, favor shallow pans.

There is no dispute as to the propriety of cooling the

milk, or of keeping it in a moist atmosphere and in a light room. Moisture prevents the cream from drying on the surface and making flacky butter, while light is essential to develop the color so much desired.

The temperature, it is asserted, may be allowed to go lower for butter than for cheese. We would not allow it to go below 55° for butter, and believe it would be better to keep it at 60°. The best temperature for churning is admitted to be between 60° and 65°—the latter for cold and the former for hot weather, making a mean temperature of 62° to 63° as the proper point. Possibly different dairies may require a slightly different temperature. The cream should be allowed to become slightly sour if a good keeping article is required, but care should be taken that the cream does not get too old and seriously injure the flavor. Sweet cream makes the best-flavored butter, but the yield is smaller and it does not keep as well.

The best method of churning has not yet been determined. Many patent churns have been presented to the public, but none of them have been any real improvement on the old-fashioned dash-churn. There is some dispute as to what causes the separation of the butter from the milk. Some say it is the concussion; some that it is the incorporation of the air with the cream. Certain it is that agitation is necessary. Forcing air through the cream while agitating it makes the butter separate quicker, but it injures the quality. What is wanted is some method that will agitate every

particle of cream alike, making the butter all come at once and of the same texture. By every method yet devised there is some cream at the sides, corners or ends, that does not get so much churning as the rest. This lessens the yield and makes the quality uneven. At least a half hour should be consumed in churning. Where the milk is churned it is allowed to change somewhat. The yield of butter is larger, but it contains more caseine, and is therefore inferior. More power is required to churn with.

If the butter comes firm and solid and separates freely from the milk, but little working will be required to expel the buttermilk. The less it is worked the better, if the buttermilk is got out and the salt is evenly incorporated. It is better to wash the butter than to work it too much without, but whether worked or not, the buttermilk must be expelled or it will injure the flavor and the keeping quality. Indeed, it is asserted that *pure* butter will keep almost indefinitely without salt. But such butter cannot be produced by the ordinary process. So salt must be added to make it keep. The quantity used by our best butter-makers varies from one-half to one ounce of salt to one pound of butter. Some salt considerably higher and go entirely by the taste. Enough salt should be used to convert the remaining buttermilk and water into brine, or the butter will soon lose its flavor and become rancid.

Butter factories, as well as cheese factories, are becoming popular. Some skim all the cream they can,

and then feed the milk to hogs or calves. Some skim only the night's milk, and make the milk into cheese. A very few make skim-milk cheese, for which, however, there is but a very limited demand.

Production of Butter.—The number of pounds of butter made in the United States in 1850 was 313,345,306; in 1860 it was 460,509,854; in 1870 it was 470,536,468.

The following extract is from a paper by C. Petersen, of Windhausen, translated from the *Milch Zeitung*.

“The churning of whole milk is, as a rule, little known. It is, however, often resorted to in Holstein, where cheese is not made. The general mode of procedure is self-evident; instead of being skimmed, when it is ripe enough the whole of the milk is worked in the churn.

“All the experiments I have made to determine which method yields the most butter have been in favor of churning the whole milk when other circumstances have been equal.

“To obtain the greatest amount of butter, in churning cream, it is necessary:

“1. To be in a position to control the temperature at all times of the year.

“2. To be able always to perform the skimming at the right time.

“3. Such a daily supply of milk as will yield enough cream to allow it to be churned before its yield of butter is damaged by standing too long.

“These conditions cannot be complied with in all dairies, and the less so the smaller the establishment. The greater number of dairies depend on three or four cows, and the yield of butter is often considerably lessened by the cream standing too long, owing to the quantity not being sufficient to churn.

“In churning whole milk I always proceed as follows:

“The evening milk of one day and the morning milk of the next are churned together. The former is placed in a tub directly after milking, and the latter added to it the next morning. In summer the milk is allowed to stand, at most, two feet high in the tub; in the winter about two and a half feet. In very hot weather the morning milk is cooled down to 16° to 20° R. before it is added to the evening milk. Under these circumstances the milk is nearly always ripe for churning when the evening milk has stood thirty-six and the morning twenty-four hours. The temperature of the milk when being churned should be from $\frac{1}{2}^{\circ}$ to 1° R. warmer than when cream is churned. The churning itself should be hurried as little as possible, since the butter globules being more widely separated in milk than in cream, rather more time is needed for them to collect.

“In churning whole milk there is an increase in labor, owing to the necessity for more frequent churnings, but this is far outweighed by the other advantages resulting from it.”

The smart wife of a large farmer has informed us

how she manages in winter. She keeps her milk in a room which is kept rather warmer than common milk cellars. In the morning, on churning days, she places the large stone pot which contains the cream in a kettle of hot water on the stove, occasionally stirring it with a large spoon, until the thermometer shows 64°. This is eight degrees higher than the summer temperature, but in winter the tendency is to get cooler, while in summer the temperature commonly rises. It is then placed in the churn, and a fine mass of butter never fails to make its appearance in from one-half to three-fourths of an hour. This entirely obviates the bad practice of pouring hot water from the tea-kettle spout into the cream to warm it.

It sometimes happens that in winter churning, the small granules of butter will make their appearance a long time before they gather into a solid mass. The gathering may be much hastened by dropping into the churn a small lump of butter at this time, as a nucleus, around which the particles will soon adhere.

There is no doubt that cows fed on good, green, well-cured clover hay, or on green corn-stalks, will give better milk and better butter than such as eat black, watered clover or chocolate-colored stalks. We have found nothing equal to carrots for giving us fine yellow butter and plenty of, it in winter, while a portion of corn-meal with good wholesome fodder, with good, comfortable, clean quarters, will do very well.

So many farmers' wives, who find no difficulty in

making the best of butter from their cows during the grass season, entirely fail of success in the same line when they attempt to make butter in winter, that it may be well to say a few words on the subject. As a general rule the failure to make good butter in winter does not lie at the door of the dairywoman, but at that of the farmer who keeps and feeds the cows. Those that understand the proper method of managing the milk and cream so as to make sure of obtaining a good article of butter, if such a thing can possibly be made from the milk of their cows, are often grievously disappointed at the results of their labors, without having the least idea of the cause.

A good many experiments have been tried in Britian to demonstrate in what way the feeding of cows during winter affects the quality and value of their milk. From these it was found that the quality of the milk given varied according as the food consumed contained more or less nitrogenous elements.

With abundance of roots and hay, but without grain of any kind, the milk given, though abundant, was deficient in butter. With the addition of a small quantity of bean-meal the milk became richer and gave nearly fifty per cent. more butter and of a better quality than that from hay and roots alone. To make the production of butter in winter any advantage to the farmer, he needs to have good cows in the first place, and in the second to feed them with the object in view of producing milk that is rich in butyraceous particles. The great



JERSEY COW "ROSA"

Owned by C. L. SHARPISS, Philadelphia

point is to keep them in as high condition as is consistent with their health and breeding, and rather to feed meal of some kind, peas, corn or barley, in addition to hay, than to give them bran or roots only. Cows in full milk should get about three pounds of pea or barley meal per day, in addition to their usual allowance of hay, and if the hay can be cut and steamed, and the meal stirred in just when the hay is set by to cool after steaming, so much the better. The addition of a little bran is of advantage in giving the cows a better relish for their food and keeping their bowels in a healthy state.

“Those who condemn the Jersey cows as small yielders of milk and butter, must listen to the story of ‘Rosa,’ as told by her owner, Charles L. Sharpless, of Philadelphia. She is now five years old, is solid creamy fawn, and, combined with great volume and bone, she is neat in the head and neck, with fine legs. Her dam was a small mouse-colored cow, and her sire’s dam a small fawn-colored, neither of which would give over twelve quarts.

“We found we were making a good deal of butter, and as ‘Rosa’ looked superbly, we determined to test her butter quality. We fed her per day twenty pounds of hay, eight quarts of meal and four quarts of carrots. The meal was a mixture of good wheat bran and corn-meal, in the proportion of four bushels of the former to one bushel of the latter. Her yield the first day was sixteen quarts, the second day fifteen and a half quarts,

the third day sixteen quarts, and the next morning eight quarts, being in all seven milkings, or half the week. Her milk was kept separate, was skimmed after standing thirty-six hours, and made six and three-quarter pounds of butter, or thirteen and a half pounds for the week.

“As you place Rosa and Duchess side by side there are some points of agreement and of difference that are of interest to notice. They are both wedge-shaped, with large body—Duchess the more bony, but Rosa with the greater rear volume (broader hips, etc.). They both have neat heads and necks and fine bone. Duchess is, in winter, smoke-color with brilliant white, but not with black points, she has yellow hoofs and skin, and her udder is rich yellow. Rosa has yellow hoofs, but a pale skin and udder, and would be called a butter cow inferior to Duchess, and yet she has just proved herself one-half pound greater. The color of it is the deepest—no coloring matter being used. This upsets the theory that a yellow skin is necessary for deep-colored butter; and loth as one is to believe it, the yellow skin must be looked upon as ornamental rather than essential. Perhaps a safer way to put it is, that though a rich yellow skin is evidence of butter quality, yet equally good quality may come from a pale skin.

“Again, as to vertical or rear mirrors, both these cows exhibit the broad part diminish as it rises, until, when within six to nine inches of the vulva, it is reduced to the breadth of not over an inch wide. Thus

they agree in their rear mirrors, and they agree also in udders of great capacity, these being deep and broad, and running well forward under the body.

“There is a point on which they differ: the hair on Duchess is soft and furry as a mole, that of Rosa is fairly fine, but still hair.

“So that in a word one can say, soft hair, a large mirror and a yellow skin are desirable, but there may be choice cows not conspicuous for either.

“To show how we sometimes let our best animals slip, I will add that when Rosa was a heifer I was tempted to part with her for what seemed a great price —\$500. In about two weeks she had a heifer calf, for which her owner was offered \$150. When three years old she had a second heifer which he sold for \$180, and when four years old she had a third heifer calf, which he sold for \$100. He then sold his place and all his stock, and I bought her at public sale for \$375 for her beauty. Her pale skin deceived me as to her butter quality, and her, as I thought, deficient mirror misled me as to her large yield. She now, as a five-year old, has her fourth calf, which is a bull and some two months old.

“In giving above her yield, I gave also her feed. Such is her constitution and appetite that I think she would have eaten half as much more, and in that way her yield might have been very much increased. It was good enough as it was, particularly as there have been choice cows so forced that, though the premium

was won, the cow was lost. The winter yield, on dry feed, of sixteen quarts, is considered equivalent to eighteen on grass."

It would *seem* a convenient method for a purchaser of a cow, who wished to approximate at least to the amount of butter she would yield in a week, to arrive at it by knowing the number of quarts of milk given in a day; and we have been hoping for some acknowledged standard of estimating this. The amount of milk requisite to make a pound of butter varies from five to sixteen quarts in different animals and breeds. The amount of cream also seems to vary as much, though this depends greatly on care in skimming. Jersey cows usually giving one pound of butter for every six to eight quarts of milk, very good grade cows ten to twelve quarts, and ordinary cows twelve to sixteen quarts.

It is universally conceded, we believe, that Jersey and Guernsey cows' milk requires less for a pound of butter than any other breed, circumstances being equal. Their *milk* has been passed off and sold as *cream*.

CHAPTER VII.

THE BULL; AND ON CALVING.

PREVIOUSLY to entering upon the subject of pregnant cows, a few observations on the bull may prove of great advantage.

There is a notion very prevalent that frequent bulling of the cow will ensure a calf; experience has proved this to be erroneous. Once is quite sufficient; but where the bull is of a larger kind than the cow, the latter should have the advantage of rising ground. On returning home the cow should be milked and tied up till quiet. Cattle taken to the bull are less subject to barrenness than those running with the bull.

For milking cows it is always advisable to have a bull with two or three years' advantage of age, as the stock is not then produced too large, which would probably injure the womb and produce barrenness. The heifer should not be taken to the bull younger than from eighteen to twenty-one months; and after calving, six weeks should elapse before the cow is bulled.

When the cow is heavy in calf—that is, when within about three months of the time of calving—considerable judgment is required as to her condition. At this time she should have plenty of exercise, should walk a

considerable distance to and from pasture, and when there should have to get her own living, or rather to work for her own living, if it may be so expressed, by the feed not being over-abundant. Where exercise cannot be obtained, or where the cow is kept housed or in a very small pasture, she must be prevented from getting too fresh by a diminution of the feeding qualities of her food.

If the cow continues to give her full quantity of milk up to a late period, there will be no danger at the time of calving; but if she dries up too soon, she will get too fresh to be healthy, and means must be taken to diminish her condition, either by increasing her exercise or diminishing her food. A lean cow can never come to harm by calving, but a fat one labors much more, and is liable to break the blood-vessels or to induce prolapsus, frequently resulting in death.

With heifers with their second calf care should be taken that the system be not overtaxed, and they should therefore be allowed to go dry sooner than older cows.

At no period of a cow being in calf should any putrid or offensive matter (such as pig-tubs containing all manner of decayed refuse, or horse-flesh hanging up for dogs, or dead animals in ditches or ponds) be within her scent, for so delicate is the constitution of a cow in this state that the mere smell of offensive effluvia is sufficient to make her slip her calf: the same result may be produced by her running in the same pasture with a cow who has recently slipped her calf. As the

cow advances in calf she should not be allowed to pasture with strange cattle, as they would be likely to fight or push each other about, and injury to herself and the calf might ensue: perfect quietness in this state cannot be too much recommended.

When the period of calving arrives, the cow should be taken in and well bedded forward, giving an easy declivity to the hinder parts; she should be disturbed as little as possible, but carefully watched. Every opportunity should be given to Nature to act spontaneously, but if much difficulty appears, the assistance of a veterinary surgeon should be obtained at once.

When this is rendered unnecessary by an easy labor, care should be taken to remove the caul or bladder covering the calf's head as soon as possible, to enable it to breathe; and immediately after the birth compel the cow to rise, as this action restores the overstrained parts to their proper position.

Then subdue the tendency to inflammation by immediately withdrawing the milk.

In some counties an erroneous custom prevails of giving the cow her own milk to drink just after calving, but this is an exploded and almost superstitious custom which should never be followed.

If the cow appears strong after calving, avoid giving her drenches, which produce disgust and do no good.

If medicine appears necessary, let it be given under the direction of the veterinary surgeon.

In all the numerous cases that have fallen under my

management, I have never had one occasion to give a single drench. My system is to give the cow a warm bran-mash with plenty of chilled water, not too warm, which treatment has always proved successful.

If the cow, after calving, should not milk down well, the udder should be fomented with warm water.

In a small practical work of this nature it would be useless to enter at length upon the diseases of cows, a few hints will be much better than a dry dissertation. No information that could be here imparted would be of any use in the absence of experience. It will be only necessary, therefore, to give some account of the symptoms that usually indicate disease either in existence or in embryo.

The first symptom usually is the shrinking of the milk; the second symptom is a rough and staring appearance of the coat, hollowness of the eyes and a want of moisture at the nose. What is called a chill is easily discovered by pressing with the hand on the back, anywhere behind the shoulders, which act will cause the cow to shrink if she is not in good health.

Nothing but knowledge and experience will justify the attempt to physic the cow without the advice of the veterinary surgeon; and it must be borne in mind that the object of this little book is to instruct in the management of milch cows alone, and not to enter upon the management and treatment of the various other classes of cows which are kept for a very different purpose than the production of milk and butter.

